ARCADIS Design & Consultancy for natural and built assets

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Subject:
Northern Terminal Focused Investigation Summary Report
Cold Springs Terminals
Hillside Road, Lysander, New York

ENVIRONMENT

Date:
September 28, 2018

Contact:
Vin Maresco

Phone:
315 671 9256

Email:
vin.maresco@arcadis.com

Our ref:
B0090004.0008

Dear Harry:

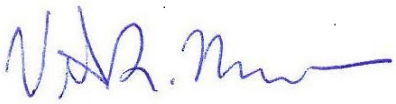
Enclosed you will find one hard copy of the above-referenced document. This document summarizes the findings generated as a result of the execution of the previously approved field work plan pertaining to the subject site. This Summary Report is submitted as required by Section I and Exhibit B of the October 19, 2017 Order on Consent.

Once you have had a chance to review the document, I would be more than happy to meet in person and discuss the findings and conclusions. I will be in touch in early October to discuss a possible meeting.

If you have any questions or require additional information before that time, please call me at 315.671.9256.

Sincerely,

Arcadis of New York, Inc.



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Principal Geologist/Project Manager

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Stephen Gonzalski, BP (electronic copy)
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Enclosure:
Northern Terminal Focused Investigation Summary Report

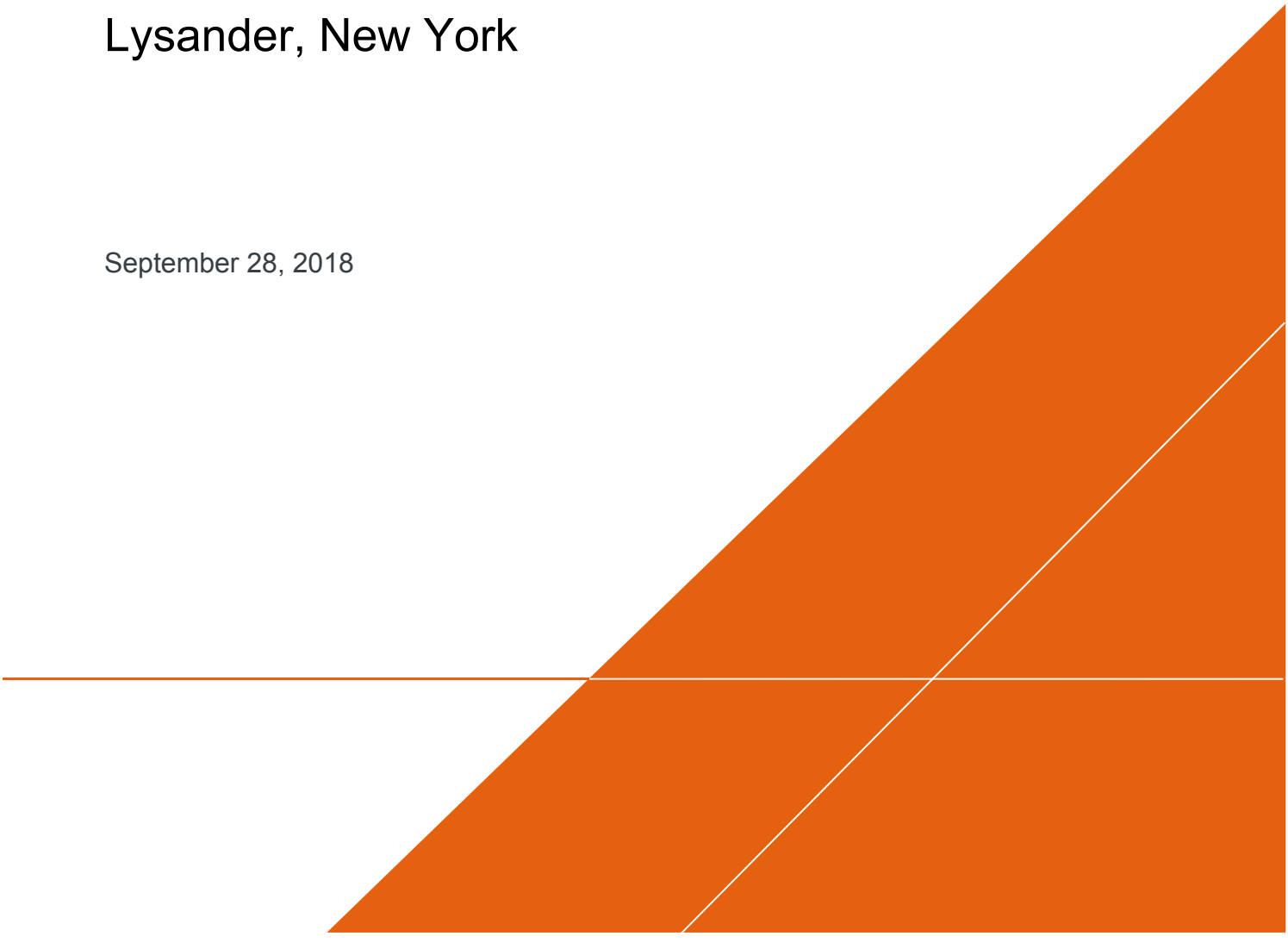
ARCADIS Design & Consultancy for natural and built assets

NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

Northern Cold Springs Terminal

Lysander, New York

September 28, 2018



NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

Northern Cold Springs Terminal
Lysander, New York

Nicholle R. Griffith
Geologist

Vincent S. Maresco
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Prepared for:

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September 28, 2018

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ACRONYMS AND ABBREVIATIONS

Arcadis	Arcadis U.S., Inc.
AST	above ground storage tank
bgs	below ground surface
FISR	Northern Terminal Focused Investigation Summary Report
FIWP	Focused Investigation Work Plan
IDW	investigation derived waste
IRAWP	Interim Remedial Action Work Plan
Northern Terminal	Northern Cold Springs Terminal
NYSDEC	New York State Department of Environmental Conservation
PID	photo-ionization detector
ppb	parts per billion
ppmv	parts per million volume
PVC	polyvinyl chloride
SCGO	standards, criteria, guidance values, or objective
Southern Terminals	Southern Cold Springs Terminals
SVOCs	semi-volatile organic compounds
TCLP	toxicity characteristic leaching procedure
TOGS 1.1.1	Technical & Operational Guidance Series memo 1.1.1
VOCs	volatile organic compounds

1 INTRODUCTION

This Northern Terminal Focused Investigation Summary Report (FISR) summarizes the work performed and the findings of the Focused Investigation regarding samples taken from soil and groundwater from the Northern Cold Springs Terminal (Northern Terminal) north of Hillside Road, as well as soil samples collected along the right-of-way area between the Southern Cold Springs Terminals (Southern Terminals) containing three underground delivery lines which serviced the Northern Terminal, and soil samples along Hillside Road. The study area is located on Hillside Road, Hamlet of Cold Springs, Town of Lysander, New York (Figure 1). The Focused Investigation activities described in this document were performed in mobilizations in 2016 and 2018 by Arcadis U.S., Inc. (Arcadis) as detailed below.

The Focused Investigation consisted of:

- Advancing soil borings and collecting soil samples from borings B101 through B110, B112 through B121, and B123 through B125 to: (1) better define subsurface stratigraphy; and (2) assess the vertical and horizontal nature and extent of subsurface impacts within the area (Figure 2). (Note there are no locations B111 or B122.)
- The installation of groundwater wells and collection of samples to: (1) monitor existing water quality; and (2) assess current groundwater characteristics to better determine future remedial actions and options for the Northern Terminal (Figure 3).

The Focused Investigation was performed in accordance with the Focused Investigation Work Plan (Arcadis 2016) (FIWP) and the Supplemental Characterization and Interim Remedial Action Work Plan (Arcadis 2018a) (IRAWP). Both work plans were submitted to the New York State Department of Environmental Conservation (NYSDEC) for input, review, and approval prior to field implementation. However, at the time of the 2016 FIWP submission, the NYSDEC would not provide formal approval in the absence of a corresponding control document. The 2018 IRAWP was approved by the NYSDEC. Appendix 1 presents both work plans as well as the NYSDEC approval of the 2018 IRAWP.

1.1 Areas of Investigation

The area of the site that was investigated as part of these work scopes included soil borings distributed as follows:

- The Northern Terminal historical above ground storage tank (AST) operational area (MW201-211);
- The right-of-way between the two Southern Terminals where the delivery lines to the Northern Terminal exist (borings B112-113); and,
- The area along Hillside Road (borings B101 through B110 and B114 through 121).

1.2 Overview and Summary

This document presents the findings of soil data collected across the former operational area of the Northern Terminal, the right-of-way between the two Southern Terminals, and along Hillside Road between the Northern Terminal and the Southern Terminals. Soil data were further divided to evaluate samples collected in the unsaturated zone (above the water table) separate from those samples collected

in the saturated zone (within the water table). In addition to the soil data noted above this document also presents groundwater data from the former AST operational area of the Northern Terminal.

Although there were several borings where trace levels of soil impacts were detected in the unsaturated and saturated zones in the former operational area of the Northern Terminal, there were no CP-51 exceedances detected in any soil sample collected within the former Northern Terminal in either the unsaturated or saturated horizon for any compound.

Soil samples collected in the right-of-way between the two Southern Terminals suggest a spill source near B113. The vertical data profile indicated that the unsaturated zone exceedances occur in the sample collected at 2-4 feet below ground surface (bgs) and are vertically isolated from the lower exceedances found in the saturated zone at this boring location. Data collected from the 4-6 feet bgs horizon indicated no exceedances, the 6-8 ft bgs sample indicated one exceedance while samples collected from 8-14 feet below grade all indicated multiple compound exceedances. Table 2 presents the vertical profile sample results. It is also worth noting that the unsaturated zone samples from B112, also completed in the right-of-way do not indicate any exceedances.

Samples collected in the area along Hillside Road (between the Northern Terminal and the Southern Terminals) indicated localized unsaturated zone CP-51 exceedances in the study area at B102 and B118. However, saturated zone CP-51 exceedances have been detected at all soil borings except B115, B116, and B117. The data suggest that there is a spill source proximal to and likely south of the boring locations of B102 and B118 as well as impacts sourced from other areas effecting the saturated zone across this portion of the study area.

Groundwater sampling data from the former Northern Terminal indicated trace amounts of NAPL at BMW5 and dissolved exceedances at BMW13 and BMW14R. The remainder of the groundwater monitoring wells sampled as part of this investigation did not indicate dissolved phase exceedances.

The following conclusions are drawn from this data set:

- On the Northern Terminal, a spill source large enough to cause CP-51 range exceedances in soil or groundwater was not found as part of this investigation. There are no exceedances in any soil or groundwater sample collected within the historic AST operational area of the Northern Terminal.
- In the right-of-way area between the Southern Terminals, the unsaturated zone soil data collected from B112 and B113 suggest a spill source in one sample from B113. There were no unsaturated zone soil exceedances at B112. As noted above, the unsaturated zone exceedances at B113 are vertically isolated from saturated zone findings at this location.
- Along Hillside Road, a spill source is suggested in the area south of B102 and B118. This conclusion is further supported by the data set from borings B114 through B117.
- Widespread saturated zone impacts found across the area between the Northern Terminal and the Southern Terminals do not appear to be sourced from the Northern Terminal. This is based on the absence of soil or groundwater exceedances in historical AST operational area of the Northern Terminal as well as the findings from the Focused Groundwater Elevation Investigation Summary (Arcadis 2018b).

2 FOCUSED INVESTIGATION FIELD ACTIVITIES AND METHODS

Key work activities performed as part of the FIWP are described under the following subsections:

Subsection 2.1 – Pre-Investigation Activities

Subsection 2.2 – Soil Boring and Sampling Activities

Subsection 2.3 – Existing Monitoring Well Groundwater Sampling Activities

Subsection 2.4 – Installation of Northern Terminal Monitoring Wells

Subsection 2.5 – Survey

2.1 Site Reconnaissance and Pre-Investigation Activities

Tailgate pre-entry safety meetings and pre-entry site walks (reconnaissance) were conducted for each mobilization and were attended by personnel from Buckeye Pipeline Company, Arcadis, and relevant Arcadis subcontractors. The tailgate meetings were held to discuss the scope of work and coordinate logistics (site access, work hours, health and safety expectations, etc.). In each instance the meeting was followed by a reconnaissance site walk to observe infrastructure locations and assess the location of any utilities, obstructions, or other logistical challenges that would cause scope modifications or delays. In certain instances, some sample locations were adjusted accordingly to site conditions to ensure work was completed in an efficient and safe manner. All adjustments were considered minor and only field updates to the NYSDEC were required and provided.

Prior to each mobilization, Parratt-Wolff (drilling subcontractor) provided notification of ground disturbance as required by law to the New York Underground Facility Protection Organization (a.k.a. DigSafelyNY) for locating all subsurface utilities. Additionally, a private utility locator, Master Locators, used ground penetrating radar and electromagnetic detection tools to supplement utility mark outs in the proposed areas of investigation along Hillside Road and in the right-of-way between the Southern Terminals. Also, for each of these drilling locations, hand-clearing / soft digging methods were used to a minimum of 5 feet and a maximum of 8 feet bgs before deploying mechanical drilling tools.

Based on information learned from previous site investigations and available historic facility maps, there were three suspected distribution lines oriented north-south in the right-of-way between the Southern Terminals. These distribution lines were uncovered by hand and/or soft digging methods to approximately 8 feet bgs at three separate points (northern, middle, and southern regions) to visually verify their location, orientation, and direction. Sample locations were adjusted in an east/west direction based on proximity to utilities so as not to impact the existing infrastructure. The lines were observed to exist in this area at approximately 3.5 feet bgs.

2.2 Soil Boring and Sampling Activities

This FISR discusses a total of 20 soil borings (B101 through B110 and B112 through B121) advanced and sampled in 2016, and 11 soil borings (MW-201 through MW-211) advanced and sampled in 2018 throughout the investigation areas (Figures 2 and 3). Soil samples collected during the study period were

evaluated via USEPA Method numbers 8260 (Volatile Organic Compounds); 8270 (Semi-Volatile Organic Compounds); and 6010B (Lead).

2.2.1 2016 Soil Boring and Sampling Activities

Soil borings completed in 2016 were advanced using direct-push drilling methods. Table 1 provides the locations for all 2016 completed soil borings. Soil samples were continuously collected from grade to terminal depth using 2-inch diameter 4-foot long macro core liners. All collected soil samples were field screened for volatile organic compounds (VOCs) using a field photo-ionization detector (PID). Select soil samples were retained and submitted for laboratory analysis. Table 2 provides laboratory analytical data results while Table 3 presents PID results for soil samples. Soil characteristics were continuously logged by a geologist for texture, grainsize, moisture content, and the potential presence of impacts via field PID instrumentation. Each boring termination depth was determined in the field by the on-site Arcadis geologist. Termination depth was based on field indication of absence of impacts or 10 feet below first detection of the water table, whichever was shallower as discussed in the Work Plan (Appendix 1). For the purposes of this investigation, field determination of absence of impact was established at 50 parts per million volume (ppmv) on the field PID or less. However, at some locations these conditions were not met due to refusal at till. No borings penetrated the lower till unit. Total boring depths ranged from approximately 11.5 feet bgs to 27 feet bgs. All downhole tools were decontaminated by pressure washing between drilling locations on a temporary decontamination containment pad.

Soil samples collected for laboratory analysis were analyzed by PACE Analytical Services, Inc. of Greensburg, Pennsylvania, for constituents listed in NYSDEC Policy CP-51: Tables 3 and 4 (Soil Cleanup Levels for Gasoline and Fuel Oil Contaminated Soils, respectively). Samples were also analyzed for methyl-tert-butyl-ether and ethanol.

Soil borings were abandoned by backfilling each borehole with pelletized bentonite to above the water table and finished to ground surface with soil cuttings. Any remaining soil cuttings generated during soil sampling activities were temporally contained in properly labeled 55-gallon drums on site in the area near PZ106. Composite samples of generated waste material were collected for waste characterization analysis. All waste soil and investigation derived waste (IDW) was disposed of at Industrial Oil of Oriskany, New York.

2.2.2 2018 Soil Boring and Sampling Activities

Soil borings completed in 2018 were advanced using geoprobe and hollow stem auger drilling methods at locations for proposed monitoring wells MW-201 to MW-211 (Table 4). Soil samples were continuously collected from grade to terminal depth using 2-inch diameter 2-foot long split spoons. All collected soil samples were field screened for VOCs using a PID. Select soil samples, based on measurable PID readings, were retained and submitted for laboratory analysis in accordance with the approved 2018 IRAWP. Table 5 presents soil analytical results associated with samples collected during the advancement of borings for the monitoring wells while Table 6 provides the PID data from this group of borings. Soil characteristics were continuously logged by an Arcadis geologist for texture, grainsize, moisture content, and potential presence of impacts via field PID instrumentation. Each boring termination depth was determined in the field by the on-site geologist. Sample collection was terminated based on field indication of absence of impacts or 10 feet below first detection of the water table, or the occurrence

of a significantly different geologic unit, whichever was shallower. For the purposes of this investigation, field determination of absence of impact was established at 50 ppm on the field PID or less, as noted in the 2018 IRAWP. Total boring depths ranged from approximately 15 feet bgs to 24 feet bgs. As noted above, all downhole tools were decontaminated between boring locations by pressure washing on a temporary decontamination containment pad.

Soil samples collected for laboratory analysis were analyzed by PACE Analytical Services, Inc. of Greensburg, Pennsylvania, for constituents listed in NYSDEC Policy CP-51: Tables 3 and 4 (Soil Cleanup Levels for Gasoline and Fuel Oil Contaminated Soils, respectively).

Soil borings were subsequently converted to monitoring wells as described below in Section 2.4. Waste soil cuttings generated during soil sampling and well installation activities were temporally contained in a 20 yard roll off dumpster on the Northern Terminal site. Composite samples of generated waste material were collected for waste characterization analysis. All waste soil and solid IDW was disposed of at High Acres Landfill of Fairport, New York. Liquid IDW was transported to Covanta Environmental Solutions located in Oriskany, New York (formerly Industrial Oil, Inc.).

2.3 Groundwater Sampling Activities (Pre-Existing Wells)

This FISR presents the results of groundwater sampling collected from existing groundwater monitoring wells (BMW2, 3, 5 through 9 and 13) which was completed in May 2018. Prior to sampling activities, each well was inspected for current condition and redeveloped by a bailing and surging method to ensure sample integrity and enhance communication between the well and the water bearing unit. Two wells (BMW-1 and BMW-14) were found to be in disrepair based on age and condition and thus were not able to be developed or sampled. In consultation with the NYSDEC, both of these wells were abandoned and BMW-14R was reinstalled proximal to the former location of BMW-14.

At the time of sample collection, an oil water interface probe was used to gauge depth to liquid (Table 7) Groundwater sampling was conducted using a peristaltic pump to purge the wells of three times their water volume or if the wells ran dry during purging allowing them to recover sufficient volume before sample collection. All wells had a minimum of two total well volumes purged yielding 2.5 to 13.5 gallons removed per well based on length of water column and diameter of well casing. Sample collection was completed using a bailer. Groundwater sampling information were recorded by a field geologist for volume purged, rate purged and depth to water. The field staff used a multiprobe to measure pH, temperature, conductivity, dissolved oxygen and oxidation reeducation potential and turbidity.

Groundwater samples collected for laboratory analysis were analyzed by PACE Analytical Services, Inc. of Greensburg, Pennsylvania, via USEPA Methods 8260 and 8270 for petroleum related constituents (Table 8). Analytical results are also compared to these NYSDEC standards in Table 8.

2.4 Northern Terminal Groundwater Monitoring Wells Installation Activities

A total of eleven new monitoring wells (MW-201 through MW-211) were installed during the investigation data collection effort at the Northern Terminal locations shown on Figure 3. The new monitoring wells are designed and installed with screen across the water table within the upper unconsolidated unit.

As discussed above, the boreholes for these wells were all advanced using a hollow stem auger drilling methods to termination depths ranging from 15 feet bgs to 24 feet bgs.

Each well location was completed using either 10 or 15-foot-long screens of 2-inch-diameter, Schedule 40, 0.010-inch machine-slotted polyvinyl chloride (PVC) pipe and solid 2-inch-diameter to straddle the water table, and Schedule 40 PVC risers to extend above the ground surface. The annular space of each borehole was filled with #0 silica sand filter pack at least a foot above the top of the screen and a one-foot thick bentonite seal was installed above the filter pack. The borehole annulus was then grouted to the surface at all monitoring well locations. Each of these wells was completed above the ground surface with a protective stick up steel casing.

As discussed above in section 2.2.2, during monitoring well installation, soil samples were collected continuously for soil classification using split-spoon sampling from ground surface to the bottom of each boring to the extent practicable. A PID was used to obtain headspace readings of each sample interval as discussed above.

Monitoring wells were developed after completion to ensure communication between the screened interval and the aquifer by surge blocking and pumping. All fluids were managed as liquid IDW as noted above.

2.5 Survey

All soil boring locations, pre-existing monitoring wells sampled as part of this work scope, and newly installed monitoring wells were surveyed by C.T. Male & Associates of North Syracuse, New York, a New York State licensed surveyor. Survey information was used to convert depths to elevations at each new boring location along with confirming locations after well redevelopment. These surveyed locations are depicted on all figures represented in this document. Boring and well locational and elevation information are presented in Tables 1 and 4.

3 SOIL BORING AND SAMPLING RESULTS

This FISR separates the soil result findings into categories to better understand the different parameters and factors influencing data results. The four divisions of analytical results are the unsaturated zone, saturated zone, semi-volatile organic compounds (SVOCs) and VOCs. The two vertical zones, unsaturated and saturated, are established based on a vertical evaluation of the location of the water table. Each soil sample was determined as to being collected above or within the water table at each sample location.

Evaluating results in this manner can support and infer the spill history at each sampling location. Samples collected above the water table in the unsaturated zone are likely to demonstrate impact which is locally or proximally sourced while samples collected within the water table, within the saturated zone, have the potential to detect impacts that have migrated with groundwater flow to the sampling location.

As discussed in the work plans, PID field findings were utilized to select which samples were retained for laboratory analysis. Laboratory analytical samples were selected on a positive bias basis factoring in field water table indication as well as PID field data. Using this process, soil samples above the water table with PID detections less than 50 ppmv threshold were not universally retained for laboratory analysis. PID data is presented on Table 3.

3.1 Study Area Geology

The underlying site stratigraphy was found to be consistent with the project record documents. The 2016 borings advanced in the more northerly portion of the areas investigated generally encountered a sand dominated regime. Sand ranged from medium to fine and was present in all the borings completed in the northern areas investigated. Geologic information from the more southerly 2016 borings (B112-113) encountered a more complex interbedded sand-silt-clay subsurface. Borings completed in 2018 encountered similar geological information as the 2016 samples; mostly consisting of medium and fine sand. Borings in 2018 located in the most northern portion of the Northern Terminal, north of former AST tank, encountered a sand dominated geology with some additional components such as silty sand, silt, and gravel. Basil glacial till, when encountered, was dense and firm, poorly sorted, and highly compacted. The till was not penetrated at any location. All borings terminated at or above the basil till unit. Boring logs from 2016 and 2018 are included in Appendices 2 and 3, respectively.

3.2 Unsaturated Zone Adsorbed Phase Results

As stated above, the unsaturated zone consists of the soil and corresponding samples above the groundwater table. This zone was sampled in 2016 and in 2018 by soil borings (B101 through B110 and B112 through B121) along with 2018 borings for monitoring well installations on the Northern Terminal (MW-201 through MW-211). These borings were sampled for VOCs and SVOCs. See Appendix 4 for the associated laboratory analytical reports.

3.2.1 Volatile Organic Compound Results 2016 Soil Borings

Soil borings completed in 2016 in the area of Hillside Road and also along the right-of-way between the two Southern Terminals indicated limited unsaturated zone exceedances of CP-51 standards, criteria, guidance values, or objective (SCGO) for VOCs.

Specifically, only borings B102, B105, B113, and B118 had unsaturated SCGO exceedances. Total VOC concentrations were detected above SGCO ranged from 2 compounds exceeding SCGOs at 0-1 feet bgs at B105 with a total concentration of 19,571 parts per billion (ppb) to 6 compounds exceeding SCGOs with a total concentration of 57,501 ppb at 2-4 feet bgs at B113. None of the other borings completed in these areas of the site indicated above water table exceedances (Table 2 and Figure 4).

3.2.2 Semi-Volatile Organic Compound Results 2016 Soil Borings

In the Hillside Road and right-of-way areas of the site there were nine (9) soil boring locations where unsaturated zone soil samples indicated an exceedance of CP-51 SCGOs. The nine (9) borings B102, B105, B106, B107, B109, B112, B118, B119, B120 and indicated SCGO exceedances ranging from 1 compound with a total concentration of 773 ppb at 2-4 feet bgs at B119 to 11 compounds and a total concentration of 984,640 ppb at 0-1 feet bgs at B105 (Table 2 and Figure 5).

3.2.3 Volatile Organic Compound Results 2018 Soil Borings

As noted above, the soil borings executed in 2018 were completed in the former AST operational areas of the Northern Terminal. Data collected from the unsaturated zone soils from the 11 soil borings completed in advance of the installations of MW-201 through MW-211 did not indicate any CP-51 volatile range compound exceedances in any location from any sample. Table 5 and Figure 9 display these data. Data on Figure 9 that is represented by an NA* in the data box indicates there were no unsaturated zone soil samples with a field PID detection above 50 ppmv and thus no unsaturated zone sample was retained for laboratory analysis.

3.2.4 Semi-Volatile Organic Compound Results 2018 Soil Borings

Data collected from the unsaturated zone soils from the 11 soil borings completed in advance of the installations of MW-201 through MW-211 did not indicate any CP-51 volatile range compound exceedances in any location from any sample (Table 5 and Figure 10).

3.2.5 Lead Results 2018 Soil Borings

At the request of the NYSDEC, total lead was included in all the borings completed across the study area, and toxicity characteristic leaching procedure (TCLP) lead was completed at borings B123 through B125. At each soil boring the surface soil sample was retained for total lead. TCLP lead data was collected from the 0-2 foot bgs interval at the three noted borings and at the 2-4 foot sample at the B123 location. Lead concentration results for borings B123, B124, and B125 are reported in Table 2 and on Figure 7, while MW201 - MW-211 soil data are reported in Table 5 and on Figure 13. Total lead findings ranged from 3.9 ppm at MW-204 to 302 ppm at MW-207. All TCLP results were below method detection limits.

3.3 Saturated Zone Adsorbed Phase Results

As previously noted, saturated zone samples are those that are collected at or below the water table at any given boring location. For the purposes of this data evaluation, samples that were located immediately above the field indication of depth to water were included in the group of samples that were considered in the saturated zone (capillary fringe). This process was meant to include the samples that were affected by water table fluctuations based on seasonal conditions. See Appendix 4 for all laboratory analytical reports.

3.3.1 Volatile Organic Compound Results 2016 Soil Borings

Numerous boring locations and numerous saturated zone samples within the individual borings locations indicate SCGO exceedances across the borings completed as part of the 2016 mobilization. The maximum detection occurred at B120 where at 14-16 feet bgs a total volatile concentration of 3,169,000 ppb was recorded, and 11 individual compounds documented an exceedance of the CP-51 SCGO. In contrast to this saturated zone location, there were no saturated zone samples that indicated an SCGO exceedance at borings B115, B116, or B117 and only one compound was detected in exceedance of the SCGOs at B114 and B105. All of the remaining borings indicated saturated zone exceedances of CP-51 SCGOs. See Table 2 and Figure 6 for a presentation of these data findings.

3.3.2 Semi-Volatile Organic Compound Results 2016 Soil Borings

There are no detections of SVOCs above the CP-51 SCGOs at any borings location completed during the 2016 mobilization. See Table 2 and Figure 7 for a presentation of these data findings.

3.3.3 Volatile Organic Compound Results 2018 Soil Borings

As noted above the soil borings executed in 2018 were completed in the former AST operational areas of the Northern Terminal. Data collected from the saturated zone soils from the 11 soil borings completed in advance of the installations of MW-201 through MW-211 did not indicate any CP-51 volatile range compound exceedances in any location from any sample. See Table 5 and Figure 11 for a presentation of these data findings.

3.3.4 Semi-Volatile Organic Compound Results 2018 Soil Borings

Data collected from the saturated zone soils from the 11 soil borings completed in advance of the installations of MW-201 through MW-211 did not indicate any CP-51 semi-volatile range compound exceedances at any location from any sample. See Table 5 and Figure 12 for a presentation of these data findings.

4 GROUNDWATER ANALYTICAL SAMPLING RESULTS

The original scope of work for the initial groundwater sampling event was to collect samples from the 11 existing wells following a well head integrity evaluation. The target list of wells was all previously installed by others and are located on, or immediately adjacent to the former operational area of the Northern Terminal. Samples were successfully collected from eight (8) of the target 11 wells during the first groundwater sampling mobilization in May 2018. See Appendix 4 for all laboratory analytical reports.

The following wells were not sampled or had their sample not analyzed as follows:

BMW1: This well was found to be in un-usable condition during the well head inspection and redevelopment process. Redevelopment attempts indicated that the subsurface components of the well were broken at depth and thus not usable or repairable. With permission of the NYSDEC, this well was permanently abandoned on August 3, 2018.

BMW5: This well was in serviceable condition but was found to contain NAPL during initial gauging prior to redevelopment. The project historical record shows a history of intermittent NAPL detections at a wide range of thickness at this well location. Therefore, the detection of NAPL during development was consistent with existing historical data. The gauging event during sample collection did not indicate a measurable thickness of NAPL so a sample was collected following purging. However, upon arrival at the laboratory NAPL was visible in the sample and thus dissolved phase data is not available for this location. There were no other detections of NAPL on or adjacent to the Northern Terminal during the groundwater sampling scope of work (Table 7).

BMW14: This well was found to be un-usable condition during the wellhead inspection and development mobilization. With permission from the NYSDEC BMW14 was abandoned on August 3, 2018 and replaced with BMW14R as discussed below. The replacement well was sampled following installation, during a separate mobilization in August 2018.

4.1 Northern Terminal Groundwater Flow Pattern Data

Liquid level data collected as part of this investigation is presented in Table 7 and reduced in the form of a groundwater contour map on Figure 14. Data show that the northern parts of the Northern Terminal show the highest head values and the lowest heads proximal to Hillside Road demonstrating a clear flow pattern from the north to the south at the time of groundwater liquid level data collection. This data is consistent with the limited historical site data set for the Northern Terminal.

4.2 Dissolved Phase Northern Terminal Volatile Organic Compound Results

Concentrations of dissolved phase VOCs ranged from non-detect at BMW2, BMW3, BMW7, and BMW8 to a total volatiles concentration of 25,838 ppb at BMW13. It is worth noting that BMW13 had served as a NAPL only recovery well for many years in the project history. It is also worth noting that although there were volatile compound detections at BMW6 and BMW9 they were below the Technical & Operational Guidance Series memo 1.1.1 (TOGS 1.1.1) Ambient Water Quality Standard or Guidance Value for GA

class water. The only TOGS 1.1.1 exceedances were found at BMW13 and BMW14R. See Table 8 and Figure 15 for a presentation of these data findings.

4.3 Dissolved Phase Northern Terminal Semi-Volatile Organic Compound Results

There were no dissolved phase detections of SVOCs above TOGS 1.1.1 SCGO at the Northern Terminal wells that were sampled as part of this investigation. See Table 8 and Figure 15 for a presentation of these data findings.

5 CONCLUSIONS

As noted above, the soil findings have been divided up by compound class (VOC or SVOC) and vertical position with regard to the water table at each sampling location. Soil samples collected above the water table are described as unsaturated zone samples while soil samples collected within the water table are described as saturated zone samples. The reason for segregating the samples vertically with respect to the water table is to facilitate the ability to evaluate the samples with regard to likely spill history. Soils showing impact above the water table would have been impacted from a local or proximal source. This line of evidence of spill history is based on the concept that the major hydraulic transport mechanism for contaminants in the unsaturated soils is gravity. However, in the saturated zone there are more complex forces driving contaminant transport and migration, including the groundwater flow patterns and measurable NAPL thicknesses. Assessing the samples in this manner has the potential to allow for the interpretation of where there have been surface or near surface petroleum spills across the study area examined by this investigation.

5.1 Adsorbed Phase Contaminant Distribution

To assess contaminant distribution patterns, soil samples collected from selected soil samples were determined to be in either the saturated or unsaturated zones based on the location of the water table observed during drilling. Site-wide water table elevation was also considered when evaluating but the final determining factor was field evidence and observations during boring advancement.

All soil samples collected above the capillary fringe and water table are assessed to be in the unsaturated zone and not influenced by the water table or groundwater contaminant transport mechanisms. Soil samples collected in the capillary fringe and through the below the water table are anticipated to be influenced by the water table and are considered in the saturated zone and potentially subject to groundwater contaminant and NAPL transport mechanisms.

As discussed above, segregating the samples into unsaturated and saturated samples allowed for an assessment of the likely impact history at any given location. The premise being that when above water table impacts are detected then the boring is directly in or very close to the spill source. Conversely, samples collected in the unsaturated zone that are devoid of impacts above NYSDEC CP-51 SCGO indicate that there is no spill history at or near the subject location.

5.1.1 Unsaturated Zone Soil 2016 Data

An assessment of the shallow soil detections above the SCGO indicated there are four borings locations with SCGO exceedances and thus require discussion for proximity to a surface or near surface spill event as follows:

B102 and B118 located along Hillside Road: The data at these two borings suggest that they are located in a surface spill area of the site based on the vertical distribution of impacts above SCGOs. Sample intervals from one to 19 feet bgs and one to 18 feet bgs, respectively, at these locations indicate SCGO exceedances (Table 2). At B102, the vertical VOC maximum mass of impact occurring at three to five feet bgs and groundwater in the field was indicated in the range of nine feet bgs during boring advancement (Appendix 2). At B118, the vertical VOC maximum mass in the unsaturated zone

was detected at 4-6 feet bgs while the water table was field indicated at eight feet bgs. The location of these borings is proximal to the dispenser pad on the eastern side of the Southern Terminals. The borings completed north of B102 and B118 (which are B110, B114, B115, and B116) do not indicate any unsaturated zone exceedances of SCGOs and, therefore, a source to the north of B102 and B118 is not suggested by this data set.

B105: The unsaturated sample at this location at 0-1 feet bgs indicated limited VOC but several SVOC compounds in excess of the SCGOs. Upon review of the sample location, the remainder of the vertical results (no exceedance from any other vertical sample at this location for either VOC or SVOC range compounds), and the individual SVOC compounds above the SCGOs, it was concluded that a small amount of road pavement material was incorporated into the sample matrix. This location is not interpreted to be proximal to a near surface spill or spill source.

B113: This location was completed in right-of-way between the two Southern Terminals. This area of the site contains three underground pipelines historically part of the Northern Terminal infrastructure and used to convey petroleum products. The data from this location indicated a discontinuous pattern between unsaturated and saturated zone impacts above SCGO. The sample interval from 2-4 feet bgs indicates the presence of 6 compounds above the SCGOs and a total VOC concentration of 57,501 ppb. However, the samples above and below this interval indicated no SCGO exceedances. The samples collected in the saturated zone at this location indicate impact with the 10-11.1 feet bgs sample indicating a total VOC concentration of 194,150 ppb. These data suggest that the saturated zone impacts at this location are not continuous with the unsaturated zone impacts as they are separated by two vertical samples with either no exceedances of SCGO or only one exceedance (4-6 feet bgs no exceedances and total VOC concentration of 4,442 ppb, 6-8 feet bgs one exceedance and total VOC concentration of 14,604 ppb). (Table 2).

5.1.2 Saturated Zone Soil 2016 Data

An examination of the saturated zone soil sample results suggests that there is a mass of petroleum contaminants throughout the investigation area within the water table. The exception to this broad conclusion is the data collected in the northeast corner of the study area and is comprised of B114, B115, B116, and B117. (Table 2 and Figures 6 and 7).

As noted above, data collected from the saturated zone that indicated impacts detected above the SCGOs must be compared to the unsaturated zone samples from the same locations in order to draw conclusions on likely spill history. Comparing saturated zone and unsaturated zone samples at the same boring location allows for an interpretation as to the potential source for the impacts. Impacts at the water table that are not connected to shallow impacts at the same or immediately proximal locations are not likely locally sourced. This suggests that the mass has been transported from a more distal spill location to the location where they have been detected. This is the case with the vast majority of the 2016 saturated soil data.

The presence of unsaturated zone impacts only in the areas discussed above at B102 and B118, and lack of distinct connection between impacts present in the saturated and unsaturated zones in other locations of the study area supports the conclusion that the remainder of the impacts in the saturated zone were transported via the water table. Figures 6 and 7 present this data visually. Table 2 presents the soil data analytical results.

5.1.3 Unsaturated Zone Soil 2018 Data

As discussed above, the 2018 soil data collection event focused on the Northern Terminal historical AST operational area. Samples from this area were evaluated via field PID and in some locations by laboratory analysis. In accordance with the IRAWP, in the event that there was no field evidence of impact above the water table then a sample at or just above the water table would be retained for laboratory analysis. There were no exceedances of SCGO found in any of the unsaturated soil samples evaluated on the Northern Terminal. This suggests there is no history of spills or releases at the Northern Terminal of a magnitude large enough to indicate an SCGO exceedance.

5.1.4 Saturated Zone Soil 2018 Data

In alignment with the absence of SCGO exceedances in the unsaturated zone soil samples, there are no SCGO exceedances in the saturated zone samples collected in the Northern Terminal historical AST operational area (Table 5 and Figures 11 and 12).

5.2 Groundwater Contaminant and Flow Pattern Conclusions

As discussed in Section 4 above, the only exceedances in the dissolved phase groundwater samples collected as part of this investigation are located at BMW13 and BMW14R. The head data collected as part of this study would suggest that these locations are downgradient of the historical AST infrastructure previously located and operated on the Northern Terminal. However, there are several lines of evidence as follows indicating that these dissolved phase impacts are sourced from the Southern Terminals:

1. The conclusions reached in the Focused Groundwater Elevation Investigation Summary Report (Arcadis 2018b) for the subject site indicate that there are times when groundwater flow is from the south to the north across the river terrace portion of the site.
2. There are no unsaturated zone soil SCGO exceedances or field PID data elevated responses found in any of the unsaturated zone soil samples from the Northern Terminal historic AST operational area boring locations (MW-201-MW-211) indicative of spill events large enough to cause groundwater impacts above standards in any portion of the Northern Terminal.
3. There are no saturated zone soil SCGO exceedances or field PID data elevated responses found in any of the saturated zone soil samples from the Northern Terminal historic AST operational area boring locations (MW-201 - MW-211) suggesting that there is no spill history proximal or distal to any of these locations on the Northern Terminal.

Based on these lines of evidence there is a high likelihood that the NAPL found at BMW5 is not sourced from the Northern Terminal.

6 ONGOING ACTIVITES

In accordance with the IRAWP and in alignment with discussion with NYSDEC, third quarter groundwater samples will be collected from the newly installed wells (MW-201-MW-211) and the wells sampled as part of this study. Groundwater samples will be analyzed for petroleum-related compounds for VOCs and SVOC via USEPA Method 8260 and 8270. Sampling activities will continue in 2019 on a quarterly basis, with a data evaluation planned following the completion of the 2019 sampling events.

7 REFERENCES

Arcadis. 2016. Focused Investigation Work Plan. February.

Arcadis. 2018a. Supplemental Characterization and Interim Remedial Action Work Plan. February.

Arcadis. 2018b. Focused Groundwater Elevation Investigation Summary Report. June 15.

TABLES

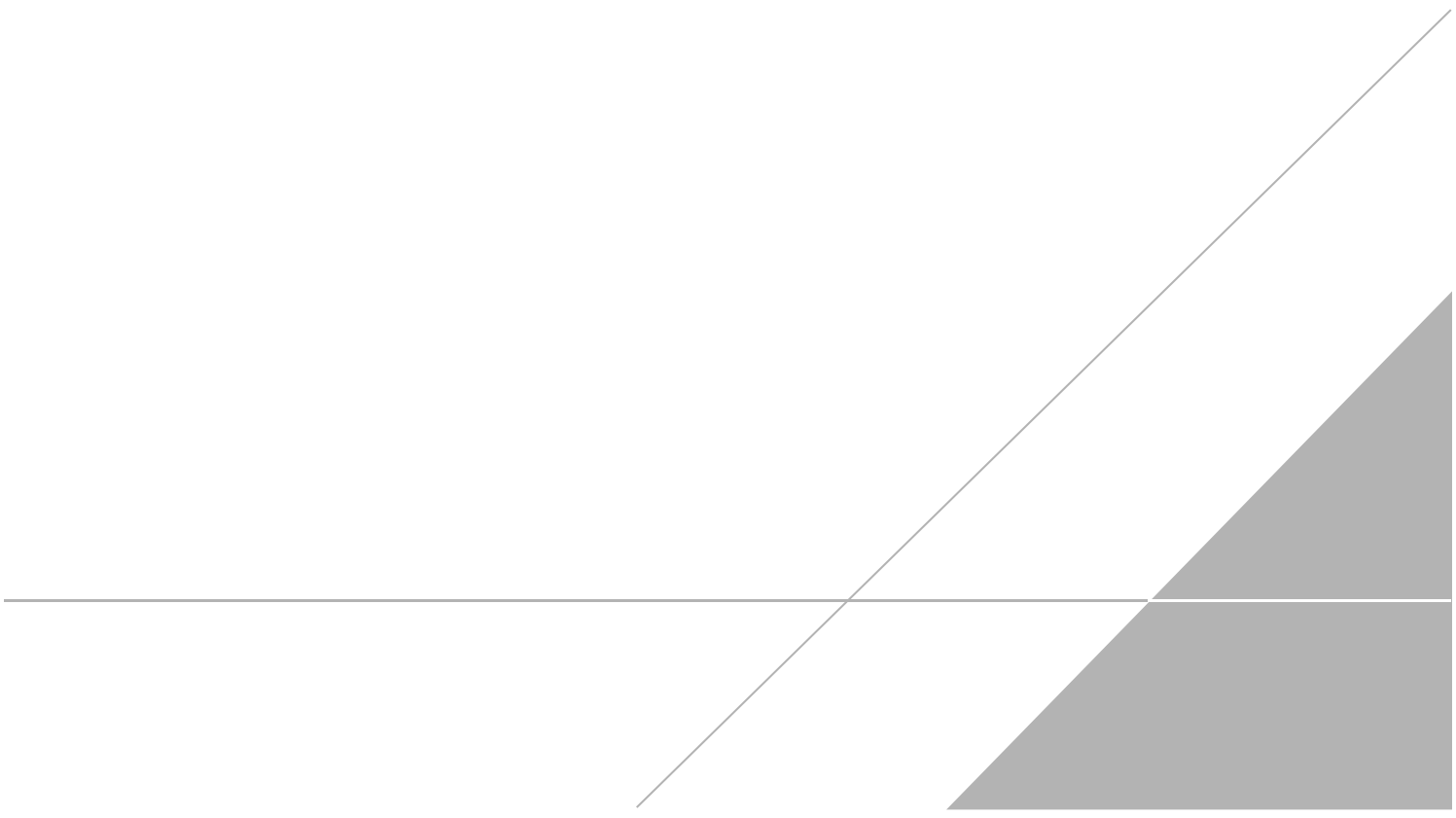

Table 1
Soil Boring Locations

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Boring ID	Northing	Easting	Ground Surface Elevation
B101	1141246.01	908795.81	386.79
B102	1141236.02	909155.78	373.94
B103	1141207.22	908844.08	379.79
B104	1141193.88	908869.76	379.38
B105	1141180.91	908788.05	378.91
B106	1141228.82	908812.97	384.45
B107	1141227.38	908949.15	381.35
B108	1141238.56	909060.36	379.74
B109	1141188.58	908970.87	378.37
B110	1141245.18	909083.59	379.01
B112	1141144.29	909019.63	375.44
B113	1141085.25	909026.70	373.81
B114	1141257.50	909120.38	374.86
B115	1141263.95	909168.02	373.98
B116	1141267.35	909198.23	373.89
B117	1141263.78	909219.02	374.58
B118	1141231.97	909122.81	374.18
B119	1141227.21	908996.59	380.28
B120	1141236.42	908995.74	380.63
B121	1141237.92	909003.71	380.01
B123	1141176.42	909019.89	376.62
B124	1141084.20	909028.46	373.87
B125	1141044.87	909047.83	371.98

Notes:

1. The coordinates are based on the New York State Plane Coordinate System, NAD 83 (North American Datum of 1983).

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)								SVOCs (EPA 8270D by SIM)	Total SVOCs
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Ethylbenzene	Isopropyl-benzene	Naphthalene	n-Propyl-benzene	Xylene (Total)	Total VOCs		
B101	0 - 2	04/20/16	386.78-384.78	6 U	6 U	6 U	6 U	6 U	6 U	12 U	240 U	No Exceedances	7.8 U
B101	2 - 4	04/05/16	384.78-382.78	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	11.6 U	232 U		7.7 U
B101	2 - 4	04/20/16	384.78-382.78	6 U	6 U	6 U	6 U	6 U	6 U	11.9 U	239 U		257
B101	4 - 6	04/20/16	382.78-380.78	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	11.9 U	238 U		8.4 U
B101	16 - 18	04/25/16	370.78-368.78	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	11.5 U	231 U		7.6 U
B101	18 - 20	04/25/16	368.78-366.78	274 U	274 U	274 U	274 U	274 U	274 U	549 U	11,000 U		26.5
B101	20 - 21.8	04/25/16	366.78-364.98	**112,000**	**36,600**	**13,900**	**3,160**	**14,300**	**11,700**	**115,400**	315,680		120.8
B101	21.8 - 24	04/25/16	364.98-362.78	15.5	5.9	5.5 U	5.5 U	5.5 U	5.5 U	11 U	21.4		8.6 U
B101	24 - 26	04/25/16	362.78-360.78	6.8	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	13.6 U	6.8		8.5 U
Number of Exceedances				1	1	1	1	1	1	1	NA	0	NA

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)										
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethylbenzene	Isopropyl-benzene	Naphthalene	n-Butyl-benzene	n-Propyl-benzene	Toluene	Xylene (Total)	Total VOCs
B102	1.1 - 1.5	04/06/16	372.83-372.43	1,270	473	**395**	276	262 U	**19,700**	262 U	262 U	262 U	523 U	22,114
B102	1.5 - 2.7	04/06/16	372.43-371.23	107	45.8	**379**	**2,950**	241	524	106	1,010	25.3	**753.1**	6,230.9
B102	3 - 5	04/06/16	370.93-368.93	**264,000**	**90,900**	**11,300**	**112,000**	**15,300**	**57,800**	**20,600**	**54,900**	**8,900**	**389,900**	1,036,520
B102	4 - 6	04/20/16	369.93-367.93	**196,000**	**61,600**	**15,000**	**84,600**	**8,990**	**33,300**	10,500	**32,800**	**19,500**	**432,000**	905,330
B102	6 - 6.4	04/20/16	367.93-367.53	**35,500**	**10,600**	**8,610**	**16,000**	1,530	5,590	1,800	**5,440**	**72,100**	**91,000**	250,071
B102	8 - 9.6	04/20/16	365.93-364.33	**137,000**	**45,800**	**16,200**	**66,600**	**5,790**	**18,000**	6,380	**20,000**	**155,000**	**326,500**	804,420
B102	16 - 18	04/20/16	357.93-355.93	**21,700**	7,080	275 U	**4,450**	1,000	3,220	1,110	3,580	580	**11,100**	54,877
B102	18 - 19	04/20/16	355.93-354.93	**40,700**	**10,700**	282 U	**7,960**	1,550	4,750	1,670	**5,510**	688	**19,640**	94,876
Number of Exceedances				6	5	6	7	3	4	1	5	4	7	NA

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	SVOCs (EPA 8270D by SIM)							
				Benz (a) Anthracene	Benzo(a) Pyrene	Benzo (b) Fluoranthene	Benzo (k) Fluoranthene	Chrysene	Dibenzo(a,h) Anthracene	Indeno (1,2,3-cd) Pyrene	Total SVOCs
B102	1.1 - 1.5	04/06/16	372.83-372.43	**26,900**	**12,000**	**33,900**	**23,200**	**12,200**	**2,180**	**4,300**	315,690
B102	1.5 - 2.7	04/06/16	372.43-371.23	64	64.3	126	125	60.9	12.8	26.2	1,111.4
B102	3 - 5	04/06/16	370.93-368.93	12.8	9.1 U	23.6	23.4	17	9.1 U	9.1 U	1,034.9
B102	4 - 6	04/20/16	369.93-367.93	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	58.6
B102	6 - 6.4	04/20/16	367.93-367.53	390	393	516	190	317	45.6	125	6,737.3
B102	8 - 9.6	04/20/16	365.93-364.33	13.5	9.5	18.2	15.4	10.5	8.1 U	8.1 U	379.7
B102	16 - 18	04/20/16	357.93-355.93	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	10
B102	18 - 19	04/20/16	355.93-354.93	8.8 U	8.8 U	8.8 U	8.8 U	8.8 U	8.8 U	8.8 U	66.6
Number of Exceedances				1	1	1	1	1	1	1	NA

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)												SVOCs (EPA 8270D by SIM)	Total SVOCs
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethyl-benzene	Isopropyl-benzene	Naph-thalene	n-Butyl-benzene	n-Propyl-benzene	p-Isopropyl-toluene	Toluene	Xylene (Total)	Total VOCs		
B103	1 - 3	04/05/16	378.79-376.79	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	13.4 U	269 U	No Exceedances	150.5
B103	4 - 5.6	04/25/16	375.79-374.19	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	10.4 U	208 U		8.1 U
B103	5.6 - 6.6	04/25/16	374.19-373.19	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	12.2 U	244 U		7.8 U
B103	8 - 9.5	04/25/16	371.79-370.29	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	11.7 U	235 U		7.5 U
B103	9.5 - 10.1	04/25/16	370.29-369.69	**106,000**	**34,700**	2,660 U	**9,570**	**2,980**	**24,900**	7,750	**10,500**	5,770	**11,200**	**115,100**	328,470		68.9
B103	12 - 13	04/25/16	367.79-366.79	**402,000**	**147,000**	3,070 U	**82,800**	**14,400**	**101,000**	**26,800**	**54,300**	**21,600**	**136,000**	**661,000**	1,654,240		1,228.8
B103	13 - 14.8	04/25/16	366.79-364.99	**447,000**	**154,000**	**8,760**	**108,000**	**15,200**	**99,300**	**25,600**	**51,900**	**22,000**	**332,000**	**932,000**	2,202,890		2,219.3
B103	16 - 18	04/25/16	363.79-361.79	**76,300**	**24,400**	**2,170**	**25,600**	**3,030**	**17,500**	4,600	**11,400**	3,520	**99,800**	**174,900**	444,370		213.1
B103	18 - 20	04/25/16	361.79-359.79	121	33	17.7	76.9	5.4 U	57.1	5.4 U	10.3	5.4 U	495	**690**	1,501		8.6 U
B103	20 - 21.5	04/25/16	359.79-358.29	13.1	5.1 U	5.1 U	14.1	5.1 U	6.9	5.1 U	5.1 U	5.1 U	5.1 U	34.7	68.8		8.4 U
B103	21.5 - 24	04/25/16	358.29-355.79	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	8 U	160 U		7.5 U
Number of Exceedances				4	4	2	4	4	4	2	4	2	4	5	NA	0	NA

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)											SVOCs (EPA 8270D by SIM)	Total SVOCs
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethyl-benzene	Isopropyl-benzene	Naphthalene	n-Butyl-benzene	n-Propyl-benzene	Toluene	Xylene (Total)	Total VOCs		
B104	3 - 5	04/05/16	376.38-374.38	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	13.3 U	267 U	No Exceedances	712.4
B104	4 - 6	04/25/16	375.38-373.38	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	12.9 U	257 U		664.7
B104	6 - 8	04/25/16	373.38-371.38	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	7 U	14.1 U	281 U		853
B104	8 - 8.8	04/25/16	371.38-370.58	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	12.9 U	257 U		8.3 U
B104	8.8 - 10.3	04/25/16	370.58-369.08	**25,700**	8,280	279 U	**1,370**	484	3,480	1,930	2,090	279 U	**13,420**	58,925		159.5
B104	12 - 13.7	04/25/16	367.38-365.68	**463,000**	**185,000**	**14,400**	**175,000**	**24,400**	**114,000**	**37,200**	**88,900**	**480,000**	**1,042,000**	2,640,970		1,249.6
B104	16 - 18	04/25/16	363.38-361.38	**4,120**	1,310	**1,080**	**1,620**	329 U	1,110	329 U	643	**6,100**	**9,710**	25,693		8.6 U
B104	18 - 20	04/25/16	361.38-359.38	108	30.8	**378**	110	6.3 U	20.7	6.3 U	14.3	**1,010**	**581**	2,252.8		8.5 U
B104	20 - 21	04/25/16	359.38-358.38	90.4	27.6	24.2	23.4	5.3 U	23.6	5.4	11.9	78.8	142.4	427.7		7.5 U
B104	21 - 23	04/25/16	358.38-356.38	8.5	5.6 U	5.6 U	5.6 U	5.6 U	8.7	5.6 U	5.6 U	5.6 U	11.2 U	17.2		7.4 U
Number of Exceedances				3	1	3	3	1	1	1	1	3	4	NA	0	NA

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)			SVOCs (EPA 8270D by SIM)				
				Naphthalene	Xylene (Total)	Total VOCs	Benz (a) Anthracene	Benzo(a) Pyrene	Benzo (b) Fluoranthene	Benzo (k) Fluoranthene	Chrysene
B105	0 - 1	04/06/16	378.9-377.9	**14,600**	**911**	19,571	**52,100**	**44,800**	**77,100**	**12,800**	**43,800**
B105	1 - 3	04/06/16	377.9-375.9	22	10.9 U	22	278	212	363	360	240
B105	3 - 5	04/06/16	375.9-373.9	8.4	13.9 U	8.4	8.1 U	8.1 U	9.8	9.7	8.1 U
B105	8 - 8.9	04/25/16	370.9-370	5.7 U	11.5 U	230 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U
B105	8.9 - 10.9	04/25/16	370-368	19.6	23.5	275.7	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U
B105	16 - 18	04/25/16	362.9-360.9	14.5	107.1	230.5	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U
B105	18 - 20	04/25/16	360.9-358.9	94.5	**511**	912.4	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U
B105	20 - 22	04/25/16	358.9-356.9	5.9 U	11.8 U	235 U	8 U	8 U	8 U	8 U	8 U
Number of Exceedances				1	2	NA	1	1	1	1	1

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	SVOCs (EPA 8270D by SIM)						
				Dibenzo(a,h) Anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) Pyrene	Phenanthrene	Pyrene	Total SVOCs
B105	0 - 1	04/06/16	378.9-377.9	**4,570**	**219,000**	**46,500**	**9,350**	**300,000**	**108,000**	984,640
B105	1 - 3	04/06/16	377.9-375.9	38.4	600	146	88.3	626	496	3,783.6
B105	3 - 5	04/06/16	375.9-373.9	8.1 U	11	8.1 U	8.1 U	8.9	9.7	49.1
B105	8 - 8.9	04/25/16	370.9-370	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U
B105	8.9 - 10.9	04/25/16	370-368	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U
B105	16 - 18	04/25/16	362.9-360.9	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U
B105	18 - 20	04/25/16	360.9-358.9	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U
B105	20 - 22	04/25/16	358.9-356.9	8 U	8 U	8 U	8 U	8 U	8 U	8 U
Number of Exceedances				1	1	1	1	1	1	NA

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)								
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Ethylbenzene	Isopropyl-benzene	Naphthalene	n-Propyl-benzene	Toluene	Xylene (Total)	Total VOCs
B106	0 - 2	04/20/16	384.44-382.44	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	12.5 U	250 U
B106	1 - 3	04/06/16	383.44-381.44	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	12.9 U	258 U
B106	2 - 4	04/20/16	382.44-380.44	8.2	6.4 U	6.4 U	6.4 U	29.8	6.4 U	6.4 U	12.9 U	38
B106	4 - 6	04/20/16	380.44-378.44	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	11.4 U	228 U
B106	14 - 15.5	04/25/16	370.44-368.94	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	11.5 U	229 U
B106	16 - 17	04/25/16	368.44-367.44	3,470	6,750	276 U	276 U	276 U	276 U	276 U	**351**	11,440
B106	17 - 19	04/25/16	367.44-365.44	**178,000**	**62,500**	**22,200**	**4,950**	**36,700**	**18,000**	**5,460**	**253,000**	598,380
B106	22 - 24	04/25/16	362.44-360.44	72.3	22.9	35.6	5.8 U	18.5	11.1	62.5	191.2	414.1
	Number of Exceedances			1	1	1	1	1	1	1	2	NA

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	SVOCs (EPA 8270D by SIM)				
				Benz(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Chrysene	Total SVOCs
B106	0 - 2	04/20/16	384.44-382.44	**1,190**	**1,170**	**2,090**	**1,090**	13,974.9
B106	1 - 3	04/06/16	383.44-381.44	71.2	101	205	96.5	1,206.2
B106	2 - 4	04/20/16	382.44-380.44	15.3	19.3	49.5	21.3	233.7
B106	4 - 6	04/20/16	380.44-378.44	8 U	8 U	8 U	8 U	8 U
B106	14 - 15.5	04/25/16	370.44-368.94	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U
B106	16 - 17	04/25/16	368.44-367.44	7.8 U	7.8 U	7.8 U	7.8 U	8.7
B106	17 - 19	04/25/16	367.44-365.44	18.5	8 U	15.2	15.1	773.9
B106	22 - 24	04/25/16	362.44-360.44	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U
	Number of Exceedances			1	1	1	1	NA

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Table 2
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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)											
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethyl-benzene	Isopropyl-benzene	Naphthalene	n-Butyl-benzene	n-Propyl-benzene	p-Isopropyl-toluene	Toluene	Xylene (Total)	Total VOCs
B107	0 - 1	04/08/16	381.35-380.35	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.9 U	5.6 U	5.6 U	5.6 U	5.6 U	11.2 U	223 U
B107	1 - 3	04/08/16	380.35-378.35	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	4.9 U	6.3 U	6.3 U	6.3 U	6.3 U	12.6 U	253 U
B107	3 - 5	04/08/16	378.35-376.35	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	10.7 U	215 U
B107	8 - 9.3	04/22/16	373.35-372.05	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	10.2 U	7.8 U	7.8 U	205 U
B107	9.3 - 11.3	04/22/16	372.05-370.05	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	13.9 U	278 U
B107	12 - 14	04/22/16	369.35-367.35	**42,700**	**21,000**	**1,060**	**12,100**	2,070	3,180	2,180	**6,070**	716	**23,800**	**82,600**	198,299
B107	14 - 14.7	04/22/16	367.35-366.65	**544,000**	**205,000**	**26,100**	**172,000**	**22,500**	**64,600**	**33,700**	**64,000**	**30,000**	**589,000**	**1,053,000**	2,814,000
B107	16 - 18	04/22/16	365.35-363.35	**179,000**	**57,700**	**20,400**	**73,900**	**7,490**	**37,400**	9,770	**27,800**	7,490	**173,000**	**412,000**	1,005,950
B107	18 - 20	04/22/16	363.35-361.35	**4,030**	1,220	**1,270**	**1,550**	265 U	1,340	265 U	566	265 U	**8,520**	**8,990**	27,486
B107	20 - 22	04/22/16	361.35-359.35	425	123	**427**	437	18.8	165	9.2	50.7	10.1	**4,030**	**1,932**	7,627.8
B107	22 - 24	04/22/16	359.35-357.35	309 U	309 U	309 U	309 U	309 U	309 U	309 U	309 U	309 U	**1,390**	618 U	1,390
Number of Exceedances				4	3	5	4	2	2	1	3	1	6	5	NA

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	SVOCs (EPA 8270D by SIM)							
				Benz(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Benzo (k) Fluoranthene	Chrysene	Dibenzo(a,h) Anthracene	Indeno (1,2,3-cd) Pyrene	Total SVOCs
B107	0 - 1	04/08/16	381.35-380.35	718	961	**1,810**	**1,400**	796	189	**574**	10,857.3
B107	1 - 3	04/08/16	380.35-378.35	**6,210**	**8,790**	**12,500**	**5,420**	**7,240**	**1,860**	**6,190**	88,571.9
B107	3 - 5	04/08/16	378.35-376.35	396	652	**1,230**	**1,220**	483	143	**505**	7,069.2
B107	8 - 9.3	04/22/16	373.35-372.05	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U
B107	9.3 - 11.3	04/22/16	372.05-370.05	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U
B107	12 - 14	04/22/16	369.35-367.35	8.8 U	8.8 U	8.8 U	8.8 U	8.8 U	8.8 U	8.8 U	9.9
B107	14 - 14.7	04/22/16	367.35-366.65	18.2	8.2 U	16.6	13.9	14.7	8.2 U	8.2 U	1,056.2
B107	16 - 18	04/22/16	365.35-363.35	12.7	8.1 U	12.3	10.1	10.3	8.1 U	8.1 U	802
B107	18 - 20	04/22/16	363.35-361.35	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U
B107	20 - 22	04/22/16	361.35-359.35	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U
B107	22 - 24	04/22/16	359.35-357.35	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U
Number of Exceedances				1	1	3	3	1	1	3	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)						
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethyl-benzene	Isopropyl-benzene	Naphthalene	n-Butyl-benzene
B108	0 - 1	04/08/16	379.73-378.73	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	5.8 U	4.9 U
B108	1 - 3	04/08/16	378.73-376.73	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.6 U	5.8 U
B108	3 - 5	04/08/16	376.73-374.73	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.1 U	5.9 U
B108	8 - 8.7	04/20/16	371.73-371.03	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
B108	8.7 - 10.6	04/20/16	371.03-369.13	**22,000**	**9,700**	287 U	**4,050**	1,010	749	1,710
B108	12 - 14	04/20/16	367.73-365.73	**273,000**	**87,400**	**17,200**	**104,000**	**12,400**	**39,000**	**15,500**
B108	14 - 16	04/20/16	365.73-363.73	**190,000**	**63,600**	**21,000**	**74,900**	**8,820**	**40,400**	**13,500**
B108	16 - 18	04/20/16	363.73-361.73	**140,000**	**46,300**	**39,800**	**60,300**	**6,780**	**35,600**	11,100
B108	18 - 20	04/20/16	361.73-359.73	**65,900**	**20,300**	**11,100**	**20,100**	**2,980**	**14,100**	5,160
B108	20 - 22	04/20/16	359.73-357.73	51.7	14.5	**276**	29.8	6.5 U	42.8	6.5 U
B108	22 - 24	04/20/16	357.73-355.73	30.5	7.9	17.2	15.9	5.7 U	40.1	5.7 U
Number of Exceedances				5	5	5	5	4	4	2

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)					SVOCs (EPA 8270D by SIM)	Total SVOCs
				n-Propyl-benzene	p-Isopropyl-toluene	Toluene	Xylene (Total)	Total VOCs		
B108	0 - 1	04/08/16	379.73-378.73	4.9 U	4.9 U	4.9 U	9.7 U	195 U	No Exceedances	1,631.4
B108	1 - 3	04/08/16	378.73-376.73	5.8 U	5.8 U	5.8 U	11.7 U	234 U		17.9
B108	3 - 5	04/08/16	376.73-374.73	5.9 U	5.9 U	5.9 U	11.8 U	237 U		195.6
B108	8 - 8.7	04/20/16	371.73-371.03	5.4 U	5.4 U	5.4 U	10.8 U	215 U		8.1 U
B108	8.7 - 10.6	04/20/16	371.03-369.13	3,240	1,790	**2,950**	**30,250**	78,131		110.3
B108	12 - 14	04/20/16	367.73-365.73	**42,000**	**13,000**	**340,000**	**628,000**	1,576,850		1,573.4
B108	14 - 16	04/20/16	365.73-363.73	**28,900**	4,180	**245,000**	**433,000**	1,128,400		8.7 U
B108	16 - 18	04/20/16	363.73-361.73	**22,200**	4,120	**172,000**	**326,200**	870,030		2,031.8
B108	18 - 20	04/20/16	361.73-359.73	**9,830**	5,440	**101,000**	**128,100**	386,370		720
B108	20 - 22	04/20/16	359.73-357.73	6.5 U	6.5 U	297	174.3	886.1		7.8 U
B108	22 - 24	04/20/16	357.73-355.73	5.7 U	5.7 U	105	79.7	296.3		7.9 U
Number of Exceedances				4	1	5	5	NA	0	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)									
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethylbenzene	Isopropyl-benzene	Naphthalene	n-Propyl-benzene	Toluene	Xylene (Total)	Total VOCs
B109	0 - 2	04/08/16	378.36-376.36	5 U	5 U	5 U	5 U	5 U	5.2 U	5 U	5 U	10 U	200 U
B109	2 - 4	04/08/16	376.36-374.36	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	7.4 U	5.7 U	5.7 U	11.4 U	228 U
B109	4 - 6	04/08/16	374.36-372.36	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.4 U	6.8 U	6.8 U	13.5 U	270 U
B109	6 - 8	04/08/16	372.36-370.36	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.2 U	6.8 U	6.8 U	13.6 U	273 U
B109	8 - 8.8	04/22/16	370.36-369.56	**72,800**	**24,800**	341 U	**8,940**	2,240	**16,600**	**7,680**	**11,200**	**111,000**	266,810
B109	8.8 - 11	04/22/16	369.56-367.36	**76,700**	**25,000**	2,710 U	**30,800**	**3,370**	**14,900**	**12,000**	**99,200**	**184,000**	454,270
B109	12 - 14	04/22/16	366.36-364.36	**17,400**	5,560	**2,280**	**6,980**	725	4,290	2,640	**22,600**	**38,920**	103,590
B109	14 - 15.8	04/22/16	364.36-362.56	331	308 U	**607**	308 U	308 U	308 U	308 U	**1,040**	**988**	2,966
B109	16 - 18	04/22/16	362.36-360.36	277	80.6	**2,490**	363	12.8	123	32.7	**1,960**	**2,062**	7,406.8
B109	18 - 20	04/22/16	360.36-358.36	101	24.9	**371**	73.5	5.7 U	88.1	9.2	431	**452**	1,550.7
B109	20 - 22	04/22/16	358.36-356.36	377	109	**818**	438	17.7	182	49	**913**	682 U	2,909.4
B109	22 - 22.8	04/22/16	356.36-355.56	121	33.1	**1,370**	168	5.6	70.4	13.1	630	**798**	3,209.2
B109	24 - 26	04/22/16	354.36-352.36	30.4	6.4	10.8	8.6	5.6 U	8.1	6.5	5.8	19.1	95.7
Number of Exceedances				3	2	6	3	1	2	2	6	7	NA

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	SVOCs (EPA 8270D by SIM)							
				Benz(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Benzo(k) Fluoranthene	Chrysene	Dibenzo(a,h) Anthracene	Indeno (1,2,3-cd) Pyrene	Total SVOCs
B109	0 - 2	04/08/16	378.36-376.36	**2,940**	**4,870**	**8,450**	**8,380**	**2,690**	**1,290**	**2,990**	44,892.4
B109	2 - 4	04/08/16	376.36-374.36	8.8 U	8.8 U	13.4	13.5	8.8 U	8.8 U	8.8 U	26.9
B109	4 - 6	04/08/16	374.36-372.36	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U
B109	6 - 8	04/08/16	372.36-370.36	12.1	21.6	38.5	38.2	8.4 U	8.4 U	12.6	148.6
B109	8 - 8.8	04/22/16	370.36-369.56	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	196
B109	8.8 - 11	04/22/16	369.56-367.36	11.2	8.7 U	11.6	9.7	9.2	8.7 U	8.7 U	457.4
B109	12 - 14	04/22/16	366.36-364.36	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U
B109	14 - 15.8	04/22/16	364.36-362.56	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U
B109	16 - 18	04/22/16	362.36-360.36	8.8 U	8.8 U	13.9	11.6	8.8 U	8.8 U	8.8 U	45.5
B109	18 - 20	04/22/16	360.36-358.36	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U
B109	20 - 22	04/22/16	358.36-356.36	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U
B109	22 - 22.8	04/22/16	356.36-355.56	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U
B109	24 - 26	04/22/16	354.36-352.36	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U
Number of Exceedances				1	1	1	1	1	1	1	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)													SVOCs (EPA 8270D by SIM)	Total SVOCs
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethyl-benzene	Isopropyl-benzene	Naph-thalene	n-Butyl-benzene	n-Propyl-benzene	p-Isopropyl-toluene	sec-Butyl-benzene	Toluene	Xylene (Total)	Total VOCs		
B110	0 - 2	04/20/16	379-377	6.5 U	6.5 U	6.5 U	6.5 U	6.5 U	6.5 U	6.5 U	6.5 U	6.5 U	6.5 U	6.5 U	12.9 U	259 U	No Exceedances	3,152
B110	2 - 4	04/20/16	377-375	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	14.6 U	292 U		163.4
B110	4 - 6	04/20/16	375-373	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	11.8 U	237 U		8.9 U
B110	6 - 8	04/20/16	373-371	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	11.6 U	232 U		8.1 U
B110	8 - 10	04/25/16	371-369	**5,050**	2,090	279 U	279 U	279 U	812	279 U	279 U	279 U	279 U	279 U	**2,870**	10,822		153.2
B110	10 - 12	04/25/16	369-367	**189,000**	**67,300**	**4,430**	**16,300**	**3,360**	**27,600**	7,240	**6,760**	**11,900**	3,570	**48,400**	**339,600**	725,460		2,488
B110	12 - 13.1	04/25/16	367-365.9	**231,000**	**88,300**	**19,000**	**117,000**	**12,700**	**65,500**	**17,500**	**42,900**	**17,300**	7,270	**125,000**	**459,000**	1,202,470		2,519
B110	13.1 - 14.9	04/25/16	365.9-364.1	**328,000**	**132,000**	**47,500**	**148,000**	**19,600**	**81,900**	**27,100**	**63,600**	9,180	**11,400**	**337,000**	**718,000**	1,923,280		1,834.5
B110	16 - 18	04/25/16	363-361	**56,800**	**24,500**	**3,230**	**28,200**	**3,780**	**16,300**	6,130	**12,800**	2,240	2,820	**45,200**	**118,700**	320,700		1,705.6
B110	18 - 20	04/25/16	361-359	**156,000**	**52,600**	**17,200**	**54,500**	**7,010**	**42,800**	11,100	**24,500**	4,140	4,810	**149,000**	**309,700**	833,360		1,181.6
B110	20 - 22	04/25/16	359-357	169	58.3	6.5 U	7.9	6.5 U	140	15.8	12.1	6.5 U	6.5 U	9.7	80.3	493.1		8.6 U
B110	24 - 26	04/25/16	355-353	926	373	31.6 U	31.6 U	36	31.6 U	40.8	40	31.6 U	31.6 U	31.6 U	**994**	2,409.8		48 U
Number of Exceedances				6	5	5	5	5	5	2	5	2	1	5	7	NA	0	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)						SVOCs (EPA 8270D by SIM)	
				1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Ethylbenzene	n-Propylbenzene	Xylene (Total)	Total VOCs	Benzo(k) Fluoranthene	Total SVOCs
B112	0 - 2	04/21/16	375.43-373.43	5.3 U	5.3 U	5.3 U	5.3 U	10.6 U	212 U	**805**	6,029.5
B112	2 - 4	04/21/16	373.43-371.43	5.8 U	5.8 U	5.8 U	5.8 U	11.7 U	234 U	12.5	49.7
B112	4 - 6	04/21/16	371.43-369.43	6.1 U	6.1 U	6.1 U	6.1 U	12.2 U	243 U	8.4 U	17.7
B112	6 - 8	04/21/16	369.43-367.43	2,860	957	329	464	655 U	4,610	9.6	142
B112	8 - 10	04/21/16	367.43-365.43	**23,700**	**8,720**	**4,970**	3,720	**22,450**	73,797	10.6	646
B112	10 - 11.7	04/21/16	365.43-363.73	**40,800**	**14,600**	**4,340**	**6,480**	**16,040**	97,590	8.5 U	81.7
B112	12 - 14	04/21/16	363.43-361.43	**9,180**	3,650	839	1,670	**3,101**	23,071	8.5 U	8.5 U
B112	14 - 15	04/21/16	361.43-360.43	**4,760**	1,920	454	926	**1,580**	11,949	8.6 U	8.6 U
Number of Exceedances				4	2	2	1	4	NA	1	NA

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Table 2
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Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)								SVOCs (EPA 8270D by SIM)	Total SVOCs
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethylbenzene	n-Propyl-benzene	Toluene	Xylene (Total)	Total VOCs		
B113	0 - 2	04/21/16	373.8-371.8	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	11 U	219 U	No Exceedances	2,041.7
B113	2 - 4	04/21/16	371.8-369.8	**19,900**	**8,450**	**528**	**2,830**	**5,490**	304 U	**8,783**	57,501		12,919
B113	4 - 6	04/21/16	369.8-367.8	712	270 U	270 U	270 U	1,380	270 U	540 U	4,442		2,811.2
B113	6 - 8	04/21/16	367.8-365.8	**5,680**	2,630	335 U	466	2,360	335 U	670 U	14,604		3,071.6
B113	8 - 10	04/21/16	365.8-363.8	**48,200**	**12,500**	**646**	**16,200**	**7,020**	**8,440**	**69,200**	179,356		8,273.1
B113	10 - 11.1	04/21/16	363.8-362.7	**38,400**	**12,100**	**1,730**	**16,900**	**6,190**	**16,600**	**83,200**	194,150		1,646.5
B113	12 - 14	04/21/16	361.8-359.8	**6,000**	1,850	284 U	**2,110**	1,080	**2,290**	**9,910**	25,500		20.6
B113	14 - 15	04/21/16	359.8-358.8	88.3	24.1	34.9	101	11.2	101	**488**	900.3		14.1
B113	16 - 18	04/21/16	357.8-355.8	202	54.7	15.8	159	40.3	67	**388**	1,067.7		31.3
Number of Exceedances				5	3	3	4	3	3	6	NA	0	NA

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Northern Cold Springs Terminal
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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)		SVOCs (EPA 8270D by SIM)	Total SVOCs
				Xylene (Total)	Total VOCs		
B114	1 - 3	04/05/16	373.86-371.86	11.1 U	223 U	No Exceedances	99.7
B114	6 - 6.9	04/20/16	368.86-367.96	542 U	1,151		8.4 U
B114	8 - 10	04/20/16	366.86-364.86	551 U	1,498		457.1
B114	10 - 10.5	04/20/16	364.86-364.36	10.7 U	2,196.8		36.3
B114	16 - 18	04/20/16	358.86-356.86	**722.7**	2,328.2		8.9 U
B114	18 - 20	04/20/16	356.86-354.86	**1,160**	5,582		8.8 U
Number of Exceedances				2	NA	0	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)	Total VOCs	SVOCs (EPA 8270D by SIM)	Total SVOCs
B115	1.5 - 2	04/05/16	372.47-371.97	No Exceedances	10.1	No Exceedances	65.4
B115	8 - 10	04/20/16	365.97-363.97		266 U		8.7 U
Number of Exceedances				0	NA	0	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)	Total VOCs	SVOCs (EPA 8270D by SIM)	Total SVOCs
B116	4 - 5	04/05/16	369.88-368.88	No Exceedances	235 U	No Exceedances	8.4 U
B116	8 - 10	04/20/16	365.88-363.88		294 U		8.7 U
Number of Exceedances				0	NA	0	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)	Total VOCs	SVOCs (EPA 8270D by SIM)	Total SVOCs
B117	2.5 - 3	04/05/16	372.08-371.58	No Exceedances	249 U	No Exceedances	8.3 U
B117	8 - 10	04/20/16	366.58-364.58		296 U		9 U
Number of Exceedances				0	NA	0	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)									
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethylbenzene	Isopropyl-benzene	Naphthalene	n-Propyl-benzene	Toluene	Xylene (Total)	Total VOCs
B118	1 - 3	04/05/16	373.17-371.17	2,780	81	31.3	**1,830**	129	3,190	440	18.9	**564.9**	9,234.4
B118	3 - 5	04/05/16	371.17-369.17	1,020	320 U	320 U	819	320 U	5,050	509	320 U	639 U	7,398
B118	4 - 6	04/20/16	370.17-368.17	**23,000**	7,390	**3,450**	**10,300**	1,020	4,500	3,720	**23,800**	**54,300**	134,434
B118	6 - 7.4	04/20/16	368.17-366.77	**15,600**	4,860	3,360 U	**6,640**	3,360 U	4,260	3,360 U	**24,200**	**35,810**	91,370
B118	8 - 9.5	04/20/16	366.17-364.67	**175,000**	**54,800**	**16,900**	**86,300**	**8,160**	**35,700**	**29,200**	**204,000**	**443,000**	1,077,030
B118	12 - 14	04/20/16	362.17-360.17	2,520	162	**1,290**	465	25.7	210	78.2	**2,730**	**6,640**	14,168.4
B118	14 - 16	04/20/16	360.17-358.17	188	48.3	**939**	265	8.7	108	22.4	206	**1,576**	3,361.4
B118	16 - 18	04/20/16	358.17-356.17	140	59	**361**	276	9.6	56.4	23.8	247	**1,151**	2,323.8
Number of Exceedances				3	1	5	4	1	1	1	4	7	NA

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	SVOCs (EPA 8270D by SIM)							
				Benz(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Benzo(k) Fluoranthene	Chrysene	Dibenzo(a,h) Anthracene	Indeno (1,2,3-cd) Pyrene	Total SVOCs
B118	1 - 3	04/05/16	373.17-371.17	**8,820**	**10,100**	**11,000**	**5,330**	**7,950**	**1,300**	**3,910**	112,741
B118	3 - 5	04/05/16	371.17-369.17	**13,200**	**13,600**	**16,900**	**8,360**	**11,200**	**1,420**	**4,870**	160,820
B118	4 - 6	04/20/16	370.17-368.17	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U	354
B118	6 - 7.4	04/20/16	368.17-366.77	13.2	8.2 U	12.8	10.4	10.8	8.2 U	8.2 U	706.8
B118	8 - 9.5	04/20/16	366.17-364.67	25.1	15.6	30.6	24.9	23.4	8.2 U	8.2 U	1,081.3
B118	12 - 14	04/20/16	362.17-360.17	11.8	8.9 U	16.7	13.9	12.3	8.9 U	8.9 U	132.4
B118	14 - 16	04/20/16	360.17-358.17	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U
B118	16 - 18	04/20/16	358.17-356.17	13	8.7 U	17.1	13.8	10.3	8.7 U	8.7 U	122
Number of Exceedances				2	2	2	2	2	2	2	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)													SVOCs (EPA 8270D by SIM)	
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethyl-benzene	Isopropyl-benzene	m&p-Xylene	Naph-thalene	n-Butyl-benzene	n-Propyl-benzene	p-Isopropyl-toluene	Toluene	Xylene (Total)	Total VOCs	Acenaph-thene	Acenaph-thylene
B119	0 - 2	08/23/16	380.276-378.276	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	10.7 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	10.7 U	242 U	7.8 U	7.8 U
B119	2 - 4	08/23/16	378.276-376.276	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	11.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	11.9 U	243 U	7.4 U	7.4 U
B119	4 - 6	08/23/16	376.276-374.276	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	11.6 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	11.6 U	247 U	7.7 U	7.7 U
B119	6 - 8	08/23/16	374.276-372.276	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	12.8 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	12.8 U	223 U	7.8 U	7.8 U
B119	8 - 10	08/23/16	372.276-370.276	6 U	6 U	6 U	6 U	6 U	12 U	6 U	6 U	6 U	6 U	6 U	12 U	219 U	7.6 U	7.6 U
B119	10 - 12	08/23/16	370.276-368.276	**11,800**	**9,350**	282 U	**2,210**	751	5,450	433	2,640	2,570	1,140	668	**6,161**	32,534	29.4	7.9 U
B119	12 - 14	08/23/16	368.276-366.276	**147,000**	**69,100**	2,700 U	**29,300**	**8,950**	130,000	6,060	**14,700**	**29,400**	3,930	**29,700**	**169,500**	343,040	42.1	21.1
B119	14 - 16	08/23/16	366.276-364.276	**397,000**	**131,000**	**11,200**	**130,000**	**22,200**	464,000	**79,500**	**19,200**	**88,200**	**18,800**	**319,000**	**609,000**	1,221,810	190	130
B119	16 - 18	08/23/16	364.276-362.276	**268,000**	**86,300**	**46,100**	**103,000**	**12,300**	416,000	**50,900**	**15,000**	**44,000**	**14,200**	**396,000**	**562,000**	1,040,890	326	236
B119	18 - 20	08/23/16	362.276-360.276	2,170	341	**1,290**	415	40.1	3,260	582	29.3	5.4 U	37.7	**4,910**	**4,640**	9,826.2	8.1 U	8.1 U
B119	20 - 22	08/23/16	360.276-358.276	75	19.2	**145**	60.7	5.2 U	241	61.6	5.2 U	5.2 U	5.2 U	**916**	**368**	1,277.5	8 U	8 U
B119	22 - 24	08/23/16	358.276-356.276	144	37.2	9	10.3	5.3 U	566	70.5	5.3 U	5.3 U	5.3 U	5.3 U	**864**	271	8.1 U	8.1 U
B119	24 - 26	08/23/16	356.276-354.276	61.9	29.4	6.5	5 U	5 U	10.1 U	5 U	5 U	5 U	5 U	8.4	10.1 U	106.2	7.9 U	7.9 U
Number of Exceedances				4	4	4	4	3	0	2	3	3	2	5	7	NA	0	0

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	SVOCs (EPA 8270D by SIM)													
				Anthra-cene	Benz(a) Anthrace ne	Benzo(a) Pyrene	Benzo(b) Fluor-anthene	Benzo (g,h,i) Perylene	Benzo(k) Fluor-anthene	Chrysene	Dibenzo (a,h) Anthracene	Fluor-anthene	Fluorene	Indeno (1,2,3-cd) Pyrene	Phenan-threne	Pyrene	Total SVOCs
B119	0 - 2	08/23/16	380.276-378.276	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	10	7.8 U	7.8 U	10.3	8.1	28.4
B119	2 - 4	08/23/16	378.276-376.276	7.4 U	78.6	79.7	133	48.6	132	81	13.3	79.4	7.4 U	40.2	10.1	77.1	773
B119	4 - 6	08/23/16	376.276-374.276	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U
B119	6 - 8	08/23/16	374.276-372.276	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U	7.8 U
B119	8 - 10	08/23/16	372.276-370.276	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U
B119	10 - 12	08/23/16	370.276-368.276	12.4	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	9	24.1	7.9 U	20.1	13.4	108.4
B119	12 - 14	08/23/16	368.276-366.276	25.4	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	16.2	50.6	8.6 U	57.1	22.3	234.8
B119	14 - 16	08/23/16	366.276-364.276	95.3	79.4 U	79.4 U	79.4 U	79.4 U	79.4 U	79.4 U	79.4 U	79.4 U	307	79.4 U	399	86.1	1,207.4
B119	16 - 18	08/23/16	364.276-362.276	151	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	96.1	552	81.8 U	680	137	2,178.1
B119	18 - 20	08/23/16	362.276-360.276	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.5	8.1 U	8.5
B119	20 - 22	08/23/16	360.276-358.276	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U
B119	22 - 24	08/23/16	358.276-356.276	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U
B119	24 - 26	08/23/16	356.276-354.276	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U
Number of Exceedances				0	0	0	0	0	0	0	0	0	0	0	0	0	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)							
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethylbenzene	Isopropyl-benzene	Naphthalene	n-Butylbenzene	n-Propylbenzene
B120	0 - 2	08/23/16	380.628-378.628	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
B120	2 - 4	08/23/16	378.628-376.628	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U
B120	4 - 6	08/23/16	376.628-374.628	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U
B120	6 - 8	08/23/16	374.628-372.628	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
B120	8 - 10	08/23/16	372.628-370.628	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U
B120	10 - 12	08/23/16	370.628-368.628	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U
B120	12 - 14	08/23/16	368.628-366.628	**81,600**	**32,800**	3,330 U	**9,570**	3,330 U	7,540	5,600	**7,220**
B120	14 - 16	08/23/16	366.628-364.628	**965,000**	**316,000**	**60,800**	**275,000**	**33,900**	**163,000**	**52,900**	**117,000**
B120	16 - 18	08/23/16	364.628-362.628	**771,000**	**95,600**	**22,100**	**124,000**	**14,500**	**74,200**	**15,400**	**63,300**
B120	18 - 20	08/23/16	362.628-360.628	**180,000**	**57,300**	**21,400**	**77,300**	**8,230**	**31,500**	10,000	**29,900**
B120	20 - 22	08/23/16	360.628-358.628	12	21	21.7	50	6.1 U	84.6	6.1 U	6.1 U
B120	22 - 24	08/23/16	358.628-356.628	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U
B120	24 - 26	08/23/16	356.628-354.628	102	40.5	6 U	6 U	6 U	7.7	6 U	6 U
Number of Exceedances				4	4	3	4	3	3	2	4

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)					SVOCs (EPA 8270D by SIM)	
				p-Isopropyl-toluene	Tert-Butylbenzene	Toluene	Xylene (Total)	Total VOCs	Benzo(k) Fluoranthene	Total SVOCs
B120	0 - 2	08/23/16	380.628-378.628	5.6 U	5.6 U	5.6 U	11.3 U	232 U	74.7	440
B120	2 - 4	08/23/16	378.628-376.628	5.9 U	5.9 U	5.9 U	11.9 U	212 U	**962**	7,486.6
B120	4 - 6	08/23/16	376.628-374.628	5.9 U	5.9 U	5.9 U	11.9 U	252 U	20.6	384.6
B120	6 - 8	08/23/16	374.628-372.628	5.6 U	5.6 U	5.6 U	11.2 U	208 U	25.5	163.4
B120	8 - 10	08/23/16	372.628-370.628	5.9 U	5.9 U	5.9 U	11.7 U	233 U	7.5 U	7.5 U
B120	10 - 12	08/23/16	370.628-368.628	5.9 U	5.9 U	5.9 U	11.8 U	213 U	7.4 U	7.4 U
B120	12 - 14	08/23/16	368.628-366.628	5,630	3,330 U	**20,600**	**110,400**	170,560	18.9	183.1
B120	14 - 16	08/23/16	366.628-364.628	**45,400**	28,000 U	**1,140,000**	**2,177,000**	3,169,000	79.7 U	1,972
B120	16 - 18	08/23/16	364.628-362.628	**13,000**	2,660 U	**849,000**	**1,290,000**	2,046,190	112	1,343
B120	18 - 20	08/23/16	362.628-360.628	8,030	**25,800**	**233,000**	**423,000**	685,690	8.3 U	338.3
B120	20 - 22	08/23/16	360.628-358.628	6.1 U	6.1 U	45.4	184	234.7	7.9 U	7.9 U
B120	22 - 24	08/23/16	358.628-356.628	5.7 U	5.7 U	5.7 U	11.4 U	219 U	44.7	1,546.4
B120	24 - 26	08/23/16	356.628-354.628	6 U	6 U	9.6	47.3	159.8	7.6 U	7.6 U
Number of Exceedances				2	1	4	4	NA	1	NA

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Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)						
				1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Benzene	Ethylbenzene	Isopropyl-benzene	Naphthalene	n-Butylbenzene
B121	0 - 2	08/23/16	380.009-378.009	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U
B121	2 - 4	08/23/16	378.009-376.009	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
B121	4 - 6	08/23/16	376.009-374.009	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
B121	6 - 8	08/23/16	374.009-372.009	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
B121	8 - 10	08/23/16	372.009-370.009	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U
B121	10 - 12	08/23/16	370.009-368.009	**43,100**	**19,600**	2,730 U	**5,470**	2,730 U	3,260	3,120
B121	12 - 14	08/23/16	368.009-366.009	**123,000**	**47,800**	2,660 U	**29,700**	**5,380**	9,980	9,690
B121	14 - 16	08/23/16	366.009-364.009	**227,000**	**89,300**	**22,500**	**102,000**	**14,000**	**33,000**	**17,100**
B121	16 - 18	08/23/16	364.009-362.009	**485,000**	**166,000**	**62,600**	**173,000**	30,800 U	**102,000**	**35,900**
B121	18 - 20	08/23/16	362.009-360.009	**157,000**	**52,000**	**21,400**	**55,400**	**7,430**	**33,500**	11,600
B121	20 - 22	08/23/16	360.009-358.009	364	296 U	**1,150**	296 U	296 U	296 U	296 U
B121	22 - 24	08/23/16	358.009-356.009	111	30.8	**421**	90.9	6.2 U	73.8	6.2 U
B121	24 - 26	08/23/16	356.009-354.009	344	125	5.6 U	108	14.7	33.6	6.5
Number of Exceedances				5	5	5	5	3	3	2

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	VOCs (EPA 8260C)					SVOCs (EPA 8270D by SIM)	Total SVOCs
				n-Propylbenzene	p-Isopropyl-toluene	Toluene	Xylene (Total)	Total VOCs		
B121	0 - 2	08/23/16	380.009-378.009	5.8 U	5.8 U	5.8 U	11.7 U	212 U	No Exceedances	2,978.9
B121	2 - 4	08/23/16	378.009-376.009	6.2 U	6.2 U	6.2 U	12.4 U	224 U		25.3
B121	4 - 6	08/23/16	376.009-374.009	5.4 U	5.4 U	5.4 U	10.7 U	242 U		7.5 U
B121	6 - 8	08/23/16	374.009-372.009	5.4 U	5.4 U	5.4 U	10.8 U	252 U		7.6 U
B121	8 - 10	08/23/16	372.009-370.009	5.7 U	5.7 U	5.7 U	11.5 U	217 U		7.7 U
B121	10 - 12	08/23/16	370.009-368.009	2,800	4,680	**8,340**	**43,500**	90,370		600.1
B121	12 - 14	08/23/16	368.009-366.009	**15,800**	3,380	**59,800**	**210,300**	308,590		2,512.6
B121	14 - 16	08/23/16	366.009-364.009	**47,000**	**17,900**	**273,000**	**519,000**	849,810		1,476.4
B121	16 - 18	08/23/16	364.009-362.009	**79,500**	30,800 U	**570,000**	**988,000**	1,674,000		4,208.2
B121	18 - 20	08/23/16	362.009-360.009	**25,800**	4,610	**174,000**	**300,800**	547,990		1,104
B121	20 - 22	08/23/16	360.009-358.009	296 U	296 U	**1,650**	**1,219**	3,164		8 U
B121	22 - 24	08/23/16	358.009-356.009	14.1	6.2 U	187	**499**	928.6		8.1 U
B121	24 - 26	08/23/16	356.009-354.009	43.7	12.1	11.5	150.9	699.1		8.3 U
Number of Exceedances				4	1	6	7	NA	0	NA

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevetion Range	Lead (mg/kg)	TCLP Lead (mg/L)
B123	0 - 2	6/5/2018	376.6169-374.6169	12.2	0.025 U
B123	2 - 4	6/5/2018	374.6169-372.6169	6.6	0.025 U

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	Lead (mg/kg)	TCLP Lead (mg/L)
B124	0 - 1	6/5/2018	373.8686-372.8686	48.8	0.025 U

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Sample Depth (ft)	Date Collected	Corrected Elevation Range	Lead (mg/kg)	TCLP Lead (mg/L)
B125	0 - 2	6/5/2018	371.9756-369.9756	9.6	0.025 U

See Notes on Page 24.

Table 2
Soil Boring Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Notes:
1. Concentrations are presented in micrograms per kilogram, which is equivalent to part per billion except where otherwise noted.
2. Shaded and bold values indicate a soil clean up level exceedance.
3. Field duplicate sample results are presented in brackets.

Lab Qualifiers	Definition
1c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
U	Indicates the compound was analyzed for, but not detected.
U1c	Indicates the compound was analyzed for, but not detected. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
NA	Not analyzed/Not applicable
VOC	Volatile organic compounds
SVOC	Semivolatile organic compounds
ft	feet

Table 3
Soil Boring PID Field Results

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Depth (ft bgs)	PID (ppm)
B101	0-5	0.0
	5-8	0.0
		1.6
	8-12	1.4
	12-16	0.9
	16-20	1069
	20-24	1651
		535.1
	24-27	15.4
B102	0-4	58.7
		169.6
		>15,000
	4-8	1781
	8-12	1532
	12-16	NA
	16-19	358.7
B103	0-4	0.0
		0.0
	4-8	18.7
		453.4
	8-12	583.8
		1702
	12-16	1693
		1107
	16-20	1380
	20-24	180.1
		159.1
B104	0-4	0.0
		0.0
		0.1
		0.5
	4-8	63.5
		67.8
	8-12	293.1
		2117
	12-16	2110
		2007
	16-20	2220
		537.1
	20-24	186.7
		294
		7.1
B105	0-4	0.0
		38.4
		0.2
		3.0
	4-8	0.1
	8-12	11.5
		268.8
	12-16	NA
	16-20	186.1
		208.4

See Notes on Page 5.

Table 3
Soil Boring PID Field Results

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Depth (ft bgs)	PID (ppm)
B105 (cont.)	20-23	18.4
		0.6
B106	0-4	0.0
		0.2
		0.4
	4-8	0.6
		0.6
	8-12	0.7
	12-16	0.8
	16-20	743.1
		1601
	20-24	44.9
B107	0-4	0.0
		0.1
		0.0
	4-8	0.5
	8-12	18.5
		201.6
	12-16	2093
		1147
	16-20	2008
		697.7
	20-24	NA
B108	0-4	0.0
		0.0
		0.1
	4-8	0.0
		0.8
	8-12	3.5
		18.4
		1019
	12-16	1525
		1321
	16-20	1808
		211.5
	20-24	75
		72.9
		40.3
B109	0-8	0.0
		0.2
		0.1
		0.1
		2.3
		2.3
	8-12	1635
		1940
	12-16	1235
	16-20	240.2
		178.3
	20-24	57.5
		119.2

See Notes on Page 5.

Table 3
Soil Boring PID Field Results

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Depth (ft bgs)	PID (ppm)
B109 (cont.)	24-27.1	37.3
		37.3
B110	0-8	0.0
		0.0
		0.1
		0.9
	8-12	810.2
	12-16	1787
		1788
	16-20	871.4
		1602
	20-24	74.2
	24-27	181.7
B112	0-8	0.6
		0.5
		53.1
		163.3
	8-12	604.1
		826.4
	12-16	773.9
		47.1
B113	0-8	1.1
		1.1
		957.8
		715.8
	8-12	535.1
		876.4
	12-16	511.3
		107.8
	16-19.5	37.1
B114	0-4	0.0
		0.0
		0.0
		0.0
	4-8	2.3
		337.5
	8-12	822.4
		893.4
	12-16	NA
	16-19.6	108.7
		363.5
B115	0-4	0.0
		0.2
		35.0
	4-8	5.1
		0.7
		0.0
	8-12	8.1
	12-16	0.7
		0.0

See Notes on Page 5.

Table 3
Soil Boring PID Field Results

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Depth (ft bgs)	PID (ppm)
B116	0-4	0.0
		1.2
		5.6
	4-8	7.1
	8-11.6	0.7
		1.1
B117	0-4	0.0
		0.0
		0.0
	4-8	0.0
	8-12	0.0
		0.0
	12-15.2	0.1
		0.1
		0.1
B118	0-4	0.0
		181.7
		27.1
	4-8	1560
		1749
	8-12	1688
	12-16	73.9
		102.1
	16-20	37.3
B119	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	13.1
	10-12	505.4
	12-14	154.3
	14-16	1565
	16-18	1516
	18-20	1495
	20-22	157.1
	22-24	190.7
	24-26	0.5
B120	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	27.5
	10-12	557.9
	12-14	1872
	14-16	1697
	16-18	1526
	18-20	954.8
	20-22	144.5
	22-24	134.3
	24-26	24.4

See Notes on Page 5.

Table 3
Soil Boring PID Field Results

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Depth (ft bgs)	PID (ppm)
B121	0-2	0.0
	2-4	0.0
	4-6	0.7
	6-8	0.0
	8-10	43.6
	10-12	1366
	12-14	1657
	14-16	1302
	16-18	889.7
	18-20	970.6
	20-22	68.2
	22-24	58.3
	24-26	23.6

Notes:
ft bgs feet below ground surface
NA not applicable
ppm parts per million

Table 4
Monitoring Well Locations

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Well ID	Northing	Easting	Ground Surface Elevation
MW-201	1141290.74	908861.62	392.62
MW-202	1141329.17	908898.17	393.22
MW-203	1141307.55	909013.86	392.27
MW-204	1141427.24	908980.08	392.71
MW-205	1141543.83	908866.84	395.00
MW-206	1141541.04	908921.18	395.17
MW-207	1141519.38	908997.73	395.72
MW-208	1141526.88	909080.26	394.31
MW-209	1141600.72	909076.11	395.01
MW-210	1141345.09	909129.64	384.53
MW-211	1141377.65	909200.72	384.48

Notes:
1. The coordinates are based on the New York State Plane Coordinate System, NAD 83 (North American Datum of 1983.)

Table 5
Monitoring Well Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID: / Sample Depth(ft): / Date Collected:	CP51 Table 2 Gasoline Contaminated Soils	CP51 Table 3 Fuel Oil Contaminated Soils	Units	MW-201 0 - 2 05/18/18	MW-201 6 - 8 05/18/18	MW-201 18 - 20 05/18/18	MW-202 0 - 2 05/21/18	MW-202 10 - 12 05/21/18	MW-203 0 - 2 05/21/18	MW-203 8 - 10 05/21/18	MW-203 10 - 12 05/21/18	MW-204 0 - 2 05/22/18	MW-204 6 - 8 05/22/18	MW-204 12 - 14 05/22/18
VOCs (EPA 8260C)														
1,2,4-Trimethylbenzene	3,600	3,600	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	5 U1c	NA	4.1 U	27.3
1,3,5-Trimethylbenzene	8,400	8,400	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	5 U1c	NA	4.1 U	10.9
Benzene	60	60	ug/kg	NA	4.2 U1c	5.7 1c	5 U1c	4.7 U1c	NA	5.3 UIS1c	5 UIS1c	NA	25.3 ML	5.7
Ethanol	- -	- -	ug/kg	NA	170 U1c	189 U1c	200 U1c	188 U1c	NA	212 U1c	199 U1c	NA	163 UCV1c	177 UCV1c
Ethylbenzene	1,000	1,000	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	5 U1c	NA	4.1 U	4.4 U
Isopropylbenzene	2,300	2,300	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	5 U1c	NA	4.1 U	4.4 U
m&p-Xylene	- -	- -	ug/kg	NA	8.5 U1c	11.1 1c	10 U1c	9.4 U1c	NA	10.6 U1c	9.9 U1c	NA	8.2 U	31.9
Methyl-Tert-Butyl-Ether	930	- -	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 UIS1c	5 UIS1c	NA	4.1 U	4.4 U
Naphthalene	12,000	12,000	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	5 U1c	NA	4.1 UR1	4.4 U
n-Butylbenzene	12,000	12,000	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	58.7 1c	152 1c	NA	4.1 U	4.4 U
n-Propylbenzene	3,900	3,900	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	14.8 1c	NA	4.1 U	13.7
o-Xylene	- -	- -	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	9.9 1c	NA	4.1 U	4.8
p-Isopropyltoluene	10,000	10,000	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	5 U1c	NA	4.1 U	4.4 U
sec-Butylbenzene	11,000	11,000	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	39.5 1c	171 1c	NA	4.1 U	4.4 U
Tert-Butylbenzene	5,900	5,900	ug/kg	NA	4.2 U1c	4.7 U1c	5 U1c	4.7 U1c	NA	5.3 U1c	15.8 1c	NA	4.1 U	4.4 U
Toluene	700	700	ug/kg	NA	4.2 U1c	12.9 1c	5 U1c	4.7 U1c	NA	5.3 U1c	5 U1c	NA	5.4	7.4
Xylene (Total)	260	260	ug/kg	NA	8.5 U	11.1	10 U	9.4 U	NA	10.6 U	9.9	NA	8.2 U	36.7
Total VOCs	- -	- -	ug/kg	NA	170 U	18.6	200 U	188 U	NA	98.2	353.6	NA	30.7	65
SVOCs (EPA 8270D by SIM)														
Acenaphthene	- -	20,000	ug/kg	NA	7.9 U	8.1 U	7.7 U	8 U	NA	2,780 M6R1	2,200	NA	23.8 UP1	8 U
Acenaphthylene	- -	100,000	ug/kg	NA	7.9 U	8.1 U	7.7 U	8 U	NA	650 M6R1	473	NA	23.8 UP1	8 U
Anthracene	p	100,000	ug/kg	NA	7.9 U	8.1 U	7.7 U	8 U	NA	836 M6R1	533	NA	23.8 UP1	8 U
Benz(a)Anthracene	- -	1,000	ug/kg	NA	7.9 U	8.1 U	7.7 U	8 U	NA	92.1 UR1	82.2 U	NA	23.8 UP1	8 U
Benzo(a)Pyrene	- -	1,000	ug/kg	NA	7.9 U	8.1 U	9.7	8 U	NA	92.1 UR1	82.2 U	NA	23.8 UP1	8 U
Benzo(b)Fluoranthene	- -	1,000	ug/kg	NA	7.9 U	8.1 U	16.1	8 U	NA	92.1 UR1	82.2 Uip	NA	23.8 UP1	8 U
Benzo(g,h,i)Perylene	- -	100,000	ug/kg	NA	7.9 U	8.1 U	8.2	8 U	NA	92.1 U	82.2 U	NA	23.8 UP1	8 U
Benzo(k)Fluoranthene	- -	800	ug/kg	NA	7.9 U	8.1 U	7.7 U	8 U	NA	92.1 UR1	82.2 Uip	NA	23.8 UP1	8 U
Chrysene	- -	1,000	ug/kg	NA	7.9 U	8.1 U	8.7	8 U	NA	92.1 UM6R1	82.2 U	NA	23.8 UP1	8 U
Dibenzo(a,h)Anthracene	- -	330	ug/kg	NA	7.9 U	8.1 U	7.7 U	8 U	NA	92.1 U	82.2 U	NA	23.8 UP1	8 U
Fluoranthene	- -	100,000	ug/kg	NA	7.9 U	8.1 U	16.7	8 U	NA	243 M6R1	150	NA	23.8 UP1	8 U
Fluorene	- -	30,000	ug/kg	NA	7.9 U	8.1 U	7.7 U	8 U	NA	4,240 M6R1	3,070	NA	23.8 UP1	8 U
Indeno(1,2,3-cd)Pyrene	- -	500	ug/kg	NA	7.9 U	8.1 U	7.7 U	8 U	NA	92.1 U	82.2 U	NA	23.8 UP1	8 U
Phenanthrene	- -	100,000	ug/kg	NA	7.9 U	8.1 U	15.9	8 U	NA	946 M6R1	5,820	NA	23.8 UP1	8 U
Pyrene	- -	100,000	ug/kg	NA	7.9 U	8.1 U	16	8 U	NA	1,600 M6R1	941	NA	23.8 UP1	8 U
Total SVOCs	- -	- -	ug/kg	NA	7.9 U	8.1 U	91.3	8 U	NA	0	13,187	NA	23.8 U	8 U
Metals (EPA 6010B)														
Lead	- -	- -	mg/kg	8.5	NA	NA	9.7	NA	41.4	NA	NA	3.9	NA	NA
General Chemistry														
Percent Moisture	- -	- -	%	8.6	16.9	18.7	16	18.6	19.3	28.3	19.8	17.7	16	16.5

See Notes on Page 4.

Table 5
Monitoring Well Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID: Sample Depth(ft): Date Collected:	CP51 Table 2 Gasoline Contaminated Soils	CP51 Table 3 Fuel Oil Contaminated Soils	Units	MW-205 0 - 2 05/17/18	MW-205 2 - 4 05/17/18	MW-205 4 - 6 05/17/18	MW-205 12 - 14 05/18/18	MW-206 0 - 2 05/16/18	MW-206 12 - 14 05/17/18	MW-207 0 - 2 05/15/18	MW-207 12 - 14 05/16/18	MW-208 0 - 2 05/15/18	MW-208 12 - 14 05/15/18
VOCs (EPA 8260C)													
1,2,4-Trimethylbenzene	3,600	3,600	ug/kg	NA	10.7 1c	98.8 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
1,3,5-Trimethylbenzene	8,400	8,400	ug/kg	NA	75.6 1c	186 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
Benzene	60	60	ug/kg	NA	3.8 U1c	3.6 U1c	3.6 U1c	NA	3.7 U1c	NA	3.9 U1c	NA	5.2 U1c
Ethanol	- -	- -	ug/kg	NA	151 U1c	145 U1c	145 U1c	NA	147 UIS1c	NA	157 UIS1c	NA	192 U1c2c
Ethylbenzene	1,000	1,000	ug/kg	NA	3.8 U1c	5.3 1c	3.6 U1c	NA	3.7 U1c	NA	3.9 U1c	NA	5.2 U1c
Isopropylbenzene	2,300	2,300	ug/kg	NA	3.8 U1c	18.4 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
m&p-Xylene	- -	- -	ug/kg	NA	7.6 U1c	7.3 U1c	7.2 U1c	NA	7.3 U1c	NA	7.8 U1c	NA	10.4 U1c
Methyl-Tert-Butyl-Ether	930	- -	ug/kg	NA	3.8 U1c	3.6 U1c	3.6 U1c	NA	3.7 U1c	NA	3.9 U1c	NA	5.2 U1c
Naphthalene	12,000	12,000	ug/kg	NA	21.9 1c	116 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
n-Butylbenzene	12,000	12,000	ug/kg	NA	3.8 U1c	37.9 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
n-Propylbenzene	3,900	3,900	ug/kg	NA	3.8 U1c	46.9 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
o-Xylene	- -	- -	ug/kg	NA	3.8 U1c	3.6 U1c	3.6 U1c	NA	3.7 U1c	NA	3.9 U1c	NA	5.2 U1c
p-Isopropyltoluene	10,000	10,000	ug/kg	NA	10.2 1c	40.5 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
sec-Butylbenzene	11,000	11,000	ug/kg	NA	3.8 U1c	24.8 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
Tert-Butylbenzene	5,900	5,900	ug/kg	NA	3.9 1c	5.5 1c	3.6 U1c	NA	3.7 UIS1c	NA	3.9 UIS1c	NA	5.2 U1c
Toluene	700	700	ug/kg	NA	3.8 U1c	3.6 U1c	3.6 U1c	NA	3.7 U1c	NA	3.9 U1c	NA	9 1c
Xylene (Total)	260	260	ug/kg	NA	7.6 U	7.3 U	7.2 U	NA	7.3 U	NA	7.8 U	NA	10.4 U
Total VOCs	- -	- -	ug/kg	NA	122.3	580.1	145 U	NA	147 U	NA	157 U	NA	9
SVOCs (EPA 8270D by SIM)													
Acenaphthene	- -	20,000	ug/kg	NA	791	521 MHM1MLR1	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Acenaphthylene	- -	100,000	ug/kg	NA	160	106 R1	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Anthracene	p	100,000	ug/kg	NA	550	131 MHM1R1	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Benz(a)Anthracene	- -	1,000	ug/kg	NA	73.4 U	7.4 U	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Benzo(a)Pyrene	- -	1,000	ug/kg	NA	73.4 U	7.4 U	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Benzo(b)Fluoranthene	- -	1,000	ug/kg	NA	73.4 U	7.4 U	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Benzo(g,h,i)Perylene	- -	100,000	ug/kg	NA	73.4 U	7.4 U	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Benzo(k)Fluoranthene	- -	800	ug/kg	NA	73.4 U	7.4 U	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Chrysene	- -	1,000	ug/kg	NA	73.4 U	7.8	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Dibenzo(a,h)Anthracene	- -	330	ug/kg	NA	73.4 U	7.4 U	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Fluoranthene	- -	100,000	ug/kg	NA	73.4 U	32.4	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Fluorene	- -	30,000	ug/kg	NA	652	454 MHM1MLR1	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Indeno(1,2,3-cd)Pyrene	- -	500	ug/kg	NA	73.4 U	7.4 U	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Phenanthrene	- -	100,000	ug/kg	NA	1,270	1,130 MLM6	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Pyrene	- -	100,000	ug/kg	NA	272	152 MHM1R1	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Total SVOCs	- -	- -	ug/kg	NA	3,695	1,170.2	7 U	NA	7.1 U	NA	7.1 U	NA	8.1 U
Metals (EPA 6010B)													
Lead	- -	- -	mg/kg	86.5	NA	NA	NA	13.4	NA	302	NA	38.2	NA
General Chemistry													
Percent Moisture	- -	- -	%	15.1	9.7	10.1	6.5	22.6	7	17.6	6.8	20.5	18.9

See Notes on Page 4.

Table 5
Monitoring Well Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID: Sample Depth(ft): Date Collected:	CP51 Table 2 Gasoline Contaminated Soils	CP51 Table 3 Fuel Oil Contaminated Soils	Units	MW-209 0 - 2 05/14/18	MW-209 6 - 8 05/14/18	MW-209 10 - 12 05/14/18	MW-210 0 - 2 05/22/18	MW-210 10 - 12 05/22/18	MW-211 0 - 2 05/23/18	MW-211 6 - 8 05/23/18
VOCs (EPA 8260C)										
1,2,4-Trimethylbenzene	3,600	3,600	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
1,3,5-Trimethylbenzene	8,400	8,400	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
Benzene	60	60	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
Ethanol	- -	- -	ug/kg	NA	170 U1c	154 U1c	NA	169 UCV1c	NA	193 UCV1c
Ethylbenzene	1,000	1,000	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
Isopropylbenzene	2,300	2,300	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
m&p-Xylene	- -	- -	ug/kg	NA	8.5 U1c	7.7 U1c	NA	8.4 U	NA	9.7 U
Methyl-Tert-Butyl-Ether	930	- -	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
Naphthalene	12,000	12,000	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
n-Butylbenzene	12,000	12,000	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
n-Propylbenzene	3,900	3,900	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
o-Xylene	- -	- -	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
p-Isopropyltoluene	10,000	10,000	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
sec-Butylbenzene	11,000	11,000	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
Tert-Butylbenzene	5,900	5,900	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
Toluene	700	700	ug/kg	NA	4.3 U1c	3.9 U1c	NA	4.2 U	NA	4.8 U
Xylene (Total)	260	260	ug/kg	NA	8.5 U	7.7 U	NA	8.4 U	NA	9.7 U
Total VOCs	- -	- -	ug/kg	NA	170 U	154 U	NA	169 U	NA	193 U
SVOCs (EPA 8270D by SIM)										
Acenaphthene	- -	20,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Acenaphthylene	- -	100,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Anthracene	p	100,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Benz(a)Anthracene	- -	1,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Benzo(a)Pyrene	- -	1,000	ug/kg	NA	7 U3c	7.5 U3c	NA	8.3 U	NA	8.1 U
Benzo(b)Fluoranthene	- -	1,000	ug/kg	NA	7.6 Ip3c	7.8 Ip3c	NA	8.3 U	NA	8.1 U
Benzo(g,h,i)Perylene	- -	100,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Benzo(k)Fluoranthene	- -	800	ug/kg	NA	7 UIp	7.5 UIp	NA	8.3 U	NA	8.1 U
Chrysene	- -	1,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Dibenzo(a,h)Anthracene	- -	330	ug/kg	NA	7 UL1	7.5 UL1	NA	8.3 U	NA	8.1 U
Fluoranthene	- -	100,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Fluorene	- -	30,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Indeno(1,2,3-cd)Pyrene	- -	500	ug/kg	NA	7 UL1	7.5 UL1	NA	8.3 U	NA	8.1 U
Phenanthrene	- -	100,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Pyrene	- -	100,000	ug/kg	NA	7 U	7.5 U	NA	8.3 U	NA	8.1 U
Total SVOCs	- -	- -	ug/kg	NA	7.6	7.8	NA	8.3 U	NA	8.1 U
Metals (EPA 6010B)										
Lead	- -	- -	mg/kg	51.7	NA	NA	4.6	NA	22.2	NA
General Chemistry										
Percent Moisture	- -	- -	%	18.1	6.9	12.7	11.3	20.8	25.8	19.1

See Notes on Page 4.

Table 5
Monitoring Well Soil Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Notes:
1. Concentrations are presented in micrograms per kilogram, which is equivalent to part per billion except where otherwise noted.
2. Shaded and bold values indicate a criteria exceedance.
3. Field duplicate sample results are presented in brackets.

Lab Qualifiers	Definition
1c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Ip3c	The sample was reextracted beyond the method recommended holding time due to low terphenyl recovery. Recovery of terphenyl was within limits in the reextracted sample, and results for target analytes were similar to those for the original in hold sample extract. Results are reported from the original in hold sample extract analysis. The sample was reextracted beyond the method recommended holding time due to low terphenyl recovery. Recovery of terphenyl was within limits in the reextracted sample, and results for target analytes were similar to those for the original in hold sample extract. Results are reported from the original in hold sample extract analysis.
M6R1	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. RPD value was outside control limits.
MHM1MLR1	Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high. Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low. RPD value was outside control limits.
MHM1R1	Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high. Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. RPD value was outside control limits.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
MLM6	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low. Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.
U	Indicates the compound was analyzed for, but not detected.
U1c	Indicates the compound was analyzed for, but not detected. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
U1c2c	Indicates the compound was analyzed for, but not detected. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume. The analyte did not meet the method recommended minimum RF.
U3c	Indicates the compound was analyzed for, but not detected. RF below method recommended limit.
UCV1c	Indicates the compound was analyzed for, but not detected. This compound was outside of the 20% difference criteria but was not detected in any of the associated samples. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Uip	Indicates the compound was analyzed for, but not detected. Benzo(b)fluoranthene and benzo(k)fluoranthene were separated in the check standard but did not meet the resolution criteria in SW846 Method 8270D. Whereas sample results included are reported as individual isomers, the lab and the customer must recognize them as an isomeric pair.
UIS1c	Indicates the compound was analyzed for, but not detected. The internal standard response is below criteria. Results may be biased high. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
UL1	Indicates the compound was analyzed for, but not detected. Analyte recovery in the laboratory control sample (LCS) was above QC limits.
UM6R1	Indicates the compound was analyzed for, but not detected. Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. RPD value was outside control limits.
UP1	Indicates the compound was analyzed for, but not detected. Routine initial sample volume or weight was not used for extraction, resulting in elevated reporting limits.
UR1	Indicates the compound was analyzed for, but not detected. RPD value was outside control limits.
NA	Not analyzed.
VOC	Volatile organic compounds.
SVOC	Semivolatile organic compounds.
ug/kg	micrograms per kilogram.
mg/kg	milligrams per kilogram.

Table 6
Monitoring Well PID Field Results

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Depth (ft bgs)	PID (ppm)
MW-201	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	0.0
	10-12	0.0
	12-14	0.0
	14-16	0.0
	16-18	0.0
	18-20	0.0
	20-22	0.0
	22-24	0.0
MW-202	0-2	2.7
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	NA
	10-12	0.0
	12-14	0.0
	14-16	0.0
	16-16.5	0.0
MW-203	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	12.0
	10-12	45.7
	12-14	39.2
	14-16	12.1
	16-18	NA
	18-20	1.8
MW-204	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.5
	8-10	2.1
	10-12	4.7
	12-14	13.7
	14-16	0.6
	16-18	1.0
	18-20	0.2
MW-205	0-2	0.0
	2-4	60.5
	4-6	133.9
	6-8	17.2
	8-10	3.4
	10-12	0.6
	12-14	1.3
	14-16	0.0
	16-18	0.0
	18-20	0.0

See Notes on Page 3.

Table 6
Monitoring Well PID Field Results

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Depth (ft bgs)	PID (ppm)
MW-206	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	0.0
	10-12	0.0
	12-14	0.0
	14-16	0.0
	16-18	0.0
	18-20	0.0
MW-207	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	0.0
	10-12	0.0
	12-14	0.0
	14-16	0.0
	16-18	0.0
	18-20	0.0
MW-208	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	0.0
	10-12	0.0
	12-14	0.2
	14-16	7.1
		1.4
	16-18	3.5
	18-20	4.1
MW-209	0-2	0.0
	2-4	0.0
	4-6	0.3
	6-8	0.6
	8-10	0.4
	10-12	0.3
	12-14	0.0
	14-16	0.0
	16-18	0.0
	18-20	0.0
MW-210	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	0.0
	10-12	0.0
	12-14	0.0
	14-16	0.0
	16-18	0.0

See Notes on Page 3.

Table 6
Monitoring Well PID Field Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Depth (ft bgs)	PID (ppm)
MW-211	0-2	0.0
	2-4	0.0
	4-6	0.0
	6-8	0.0
	8-10	0.0
	10-12	0.0
	12-14	0.0
	14-16	0.0

Notes:

ft bgs feet below ground surface
NA not applicable
ppm parts per million

Table 7
Liquid Level Data - May 2018

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID	Diameter (inches)	DTB (ft bgs)	TOS (ft bgs)	DTP (TOC)	DTW (TOC)	GW Elev (ft)
BMW1*	2	15.0	5.3	NA	NA	NA
BMW2	2	34.8	15.3	ND	8.29	390.52
BMW3	2	29.7	3.5	ND	14.95	380.55
BMW5	2	30.0	10.0	ND[1]	23.59	365.91
BMW6	2	30.0	10.0	ND	27.42	367.58
BMW7	2	15.0	5.0	ND	9.05	388.76
BMW8	2	20.0	5.0	ND	8.7	391.39
BMW9	2	15.0	5.0	ND	3.82	376.47
BMW13	2	UK	UK	ND	18.19	364.37
BMW14*	2	UK	UK	NA	NA	NA
BMW14R[2]	2	20.0	5.0	ND	16.45	363.58
PZ106S	2	15.5	5.5	ND	3.64	370.87

Notes:

DTB	depth to bottom
DTP	depth to product
DTW	depth to water
ft bgs	feet below ground surface
GW Elev	groundwater elevation
NA	not applicable
ND	not detected
TOC	top of casing
TOS	top of screen
UK	unknown
*	decommissioned

[1] No product was detected in the field using an interface probe but the lab indicated petroleum was found in sample and it could not be analyzed.

[2] BMW14R was gauged August 6, 2018.

Table 8
Groundwater Sampling Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 (GA Groundwater)	Units	BMW2 05/17/18	BMW3 05/15/18	BMW6 05/16/18	BMW7 05/14/18	BMW8 05/14/18	BMW9 05/17/18	BMW13 05/17/18	BMW14R 08/06/18	PZ106S 05/17/18
VOCs (EPA 8260C)											
1,2,4-Trimethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1.3	**2,140**	**1,510**	1 U
1,3,5-Trimethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	**573**	**403**	1 U
Benzene	1	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	**4,890**	1 U	1 U
Ethanol	- -	ug/L	200 UL1CL2c	200 UCL1c	200 UL1CL4c	200 UCL1c	200 UCL1c	200 UL1CL2c	200 UL1CL2c	200 U	200 UL1CL2c
Ethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	**1,390**	**229**	1 U
Isopropylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	**71.5**	**80.6**	1 U
m&p-Xylene	5	ug/L	2 U	2 U	2 U	2 U	2 U	2 U	**7,340**	**843**	2 U
Methyl-Tert-Butyl-Ether	10	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	10	ug/L	2 U	2 U	2.6	2 U	2 U	2 U	**2,130**	**537**	2 U
n-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	**21.1**	1 U	1 U
n-Propylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**196**	1 U
o-Xylene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	**2,950**	**5.4**	1 U
p-Isopropyltoluene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	**11.3**	**9.9**	1 U
sec-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	**11.1**	**11.4**	1 U
Tert-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.6	1 U
Toluene	5	ug/L	1 U	1 U	2.2	1 U	1 U	1 U	**14,600**	1.2	1 U
Xylene (Total)	5	ug/L	2 U	2 U	2 U	2 U	2 U	2 U	**10,290**	**848.4**	2 U
Total VOCs	- -	ug/L	200 U	200 U	4.8	200 U	200 U	1.3	25,838	2,979.7	200 U
SVOCs (EPA 8270D by SIM)											
Acenaphthene	20	ug/L	0.099 U1c	0.099 U	6.5 1c	0.099 U	0.099 U	0.097 U1c	3.1 1c	0.38 1c	0.097 U1c
Acenaphthylene	- -	ug/L	0.099 U1c	0.099 U	1.9 1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.2 1c	0.097 U1c
Anthracene	50	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Benz(a)Anthracene	0.002	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Benzo(a)Pyrene	- -	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Benzo(b)Fluoranthene	0.002	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Benzo(g,h,i)Perylene	- -	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Benzo(k)Fluoranthene	0.002	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Chrysene	0.002	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Dibenzo(a,h)Anthracene	- -	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Fluoranthene	50	ug/L	0.099 U1c	0.099 UR1	1.5 1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Fluorene	50	ug/L	0.099 U1c	0.099 UR1	5.9 1c	0.099 U	0.099 U	0.097 U1c	3.2 1c	0.65 1c	0.097 U1c
Indeno(1,2,3-cd)Pyrene	0.002	ug/L	0.099 U1c	0.099 UR1	1 U1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Phenanthrene	50	ug/L	0.099 U1c	0.099 UR1	8.1 1c	0.099 U	0.099 U	0.097 U1c	2.5 1c	0.3 1c	0.097 U1c
Pyrene	50	ug/L	0.099 U1c	0.099 UR1	2.3 1c	0.099 U	0.099 U	0.097 U1c	0.98 U1c	0.1 U1c	0.097 U1c
Total SVOCs	- -	ug/L	0.099 U	0.099 U	26.2	0.099 U	0.099 U	0.097 U	8.8	1.53	0.097 U
Metals (EPA 6010B)											
Manganese	300	ug/L	**453**	**2,840 MLR1**	**925**	66.9	**1,310**	79	**9,330**	**658**	52
Dissolved Metals											
Manganese	300	ug/L	103	**518**	212	8.8	**1,250**	60.9	**7,030**	**602**	5 U
General Chemistry											
Alkalinity, Carbonate (pH4.5)	- -	mg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Alkalinity,Bicarbonate (pH4.5)	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	406	NA
Alkalinity,Total (CaCO3 pH4.5)	- -	mg/L	NA	M1ML	NA	ML	NA	NA	NA	406	NA
Iron, Ferrous	- -	mg/L	0.1 UH6H1	0.1 UH6H1	0.1 UH6H1	0.1 UH6H1	1.2 H6H1	0.1 UH6H1	13.2 H6H1	0.1 UH6H1	0.1 UH6H1
Nitrogen, NO2 plus NO3	- -	mg/L	0.1 U	0.1	0.1 U	0.1 UML	0.1 U	0.1 U	0.1 U	0.1 U	0.44
Sulfate	- -	mg/L	50 UD3	173 MH	424	67.4	109	53.7	100 UD3	43.6	50 UD3

See Notes on Page 2.

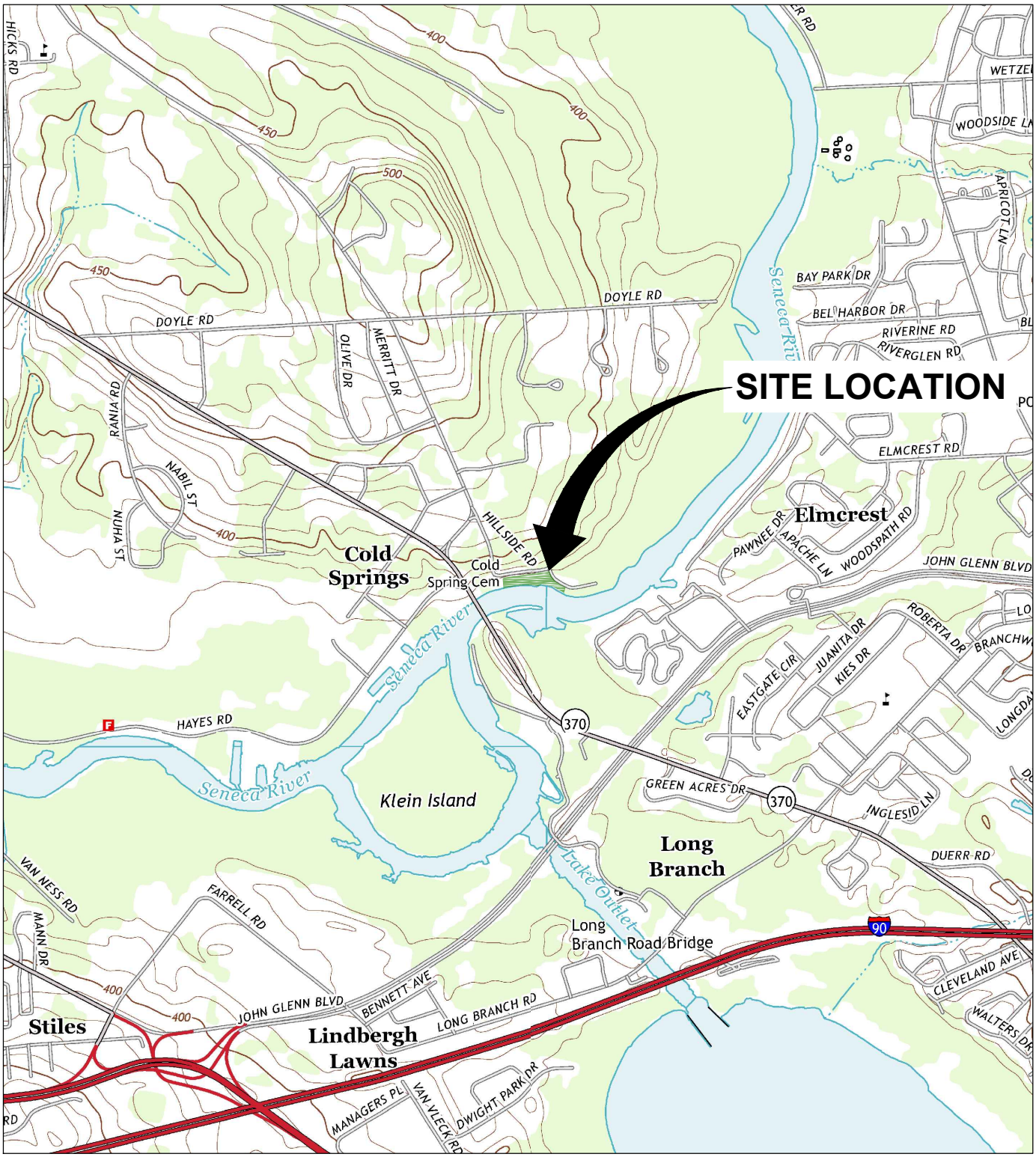
Table 8
Groundwater Sampling Analytical Results

Northern Terminal Focused Investigation Summary Report
Northern Cold Springs Terminal
Lysander, New York

Notes:
1. Concentrations are presented in micrograms per kilogram, which is equivalent to part per billion except where otherwise noted
2. Shaded and bold values indicate a criteria exceedance.
3. Field duplicate sample results are presented in brackets.

Lab Qualifiers	Definition
1c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
1c2c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume. The analyte did not meet the method recommended minimum RF.
H6H1	Analysis initiated outside of the 15 minute EPA required holding time. Analysis conducted outside the EPA method holding time.
M1ML	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
MH	Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
MLR1	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low. RPD value was outside control limits.
U	Indicates the compound was analyzed for, but not detected.
U1c	Indicates the compound was analyzed for, but not detected. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
U1c2c	Indicates the compound was analyzed for, but not detected. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume. The analyte did not meet the method recommended minimum RF.
UCL1c	Indicates the compound was analyzed for, but not detected. The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low. A matrix spike/matrix spike duplicate was not performed for this batch.
UD3	Indicates the compound was analyzed for, but not detected. Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
UH6H1	Indicates the compound was analyzed for, but not detected. Analysis initiated outside of the 15 minute EPA required holding time. Analysis conducted outside the EPA method holding time.
UL1CL2c	Indicates the compound was analyzed for, but not detected. Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low. The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low. The read back of the low concentration calibration standard for this compound is not within 30% of the true value. The results may be biased low and should be considered estimated.
UL1CL4c	Indicates the compound was analyzed for, but not detected. Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low. The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low. The sample was reextracted beyond the method recommended holding time due to low terphenyl recovery. Recovery of terphenyl was within limits in the reextracted sample, and results for target analytes were similar to those for the original in hold sample extract. Results are reported from the original in hold sample extract analysis.
UML	Indicates the compound was analyzed for, but not detected. Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
UR1	Indicates the compound was analyzed for, but not detected. RPD value was outside control limits.

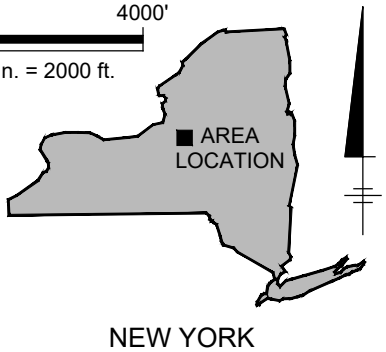
FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., BALDWINSVILLE, BREWERTON, CAMILLUS & SYRACUSE WEST, NY, 2013.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

SITE LOCATION MAP

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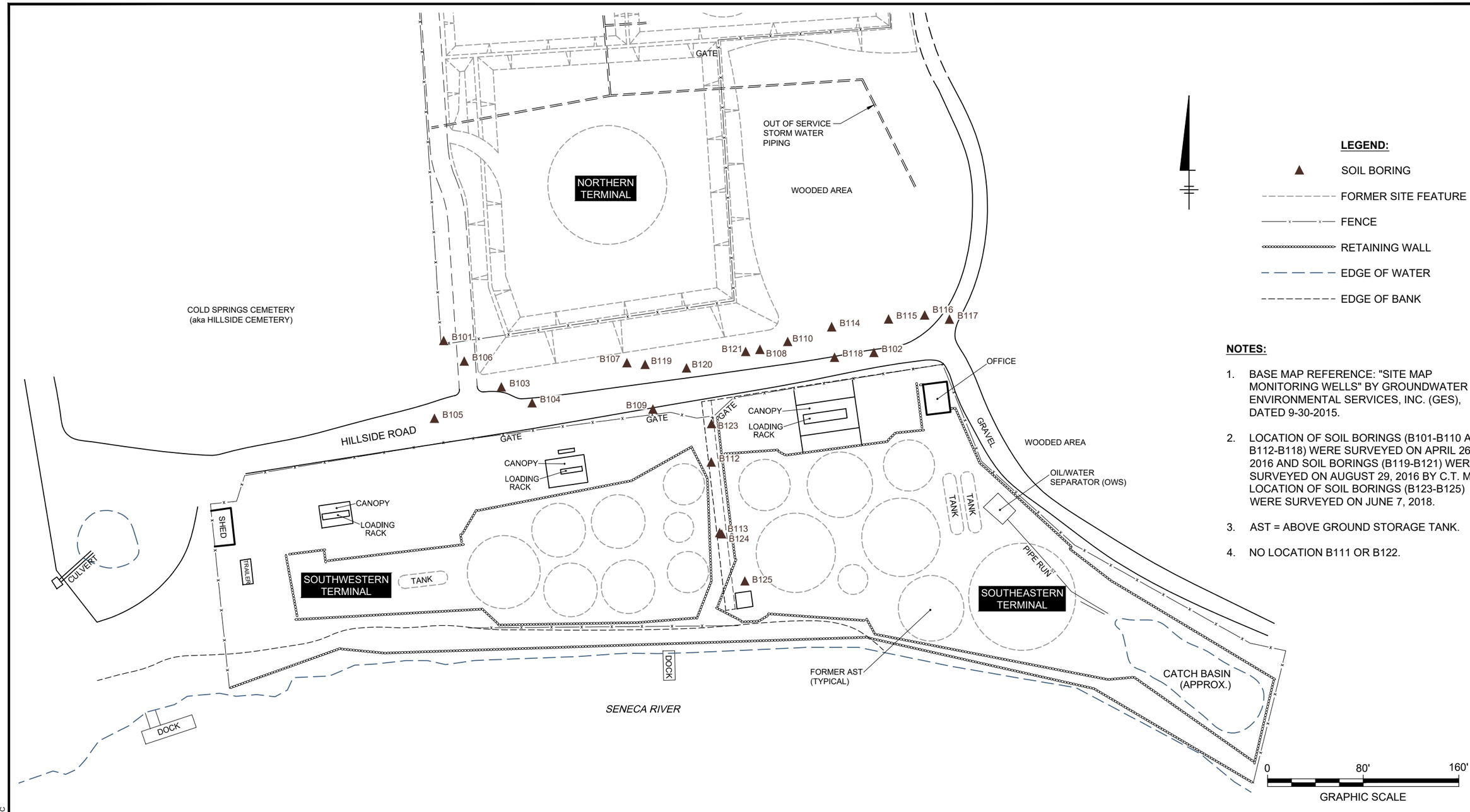
FIGURE 1



LEGEND:

- SOIL BORING
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE. LOCATION OF SOIL BORINGS (B123-B125) WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.
4. NO LOCATION B111 OR B122.

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

SITE MAP WITH SOIL BORINGS - B101 - B125

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FIGURE 2

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: TR: R. HENSEL LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig2_Site Map.dwg LAYOUT: 2 SAVED: 9/6/2018 12:41 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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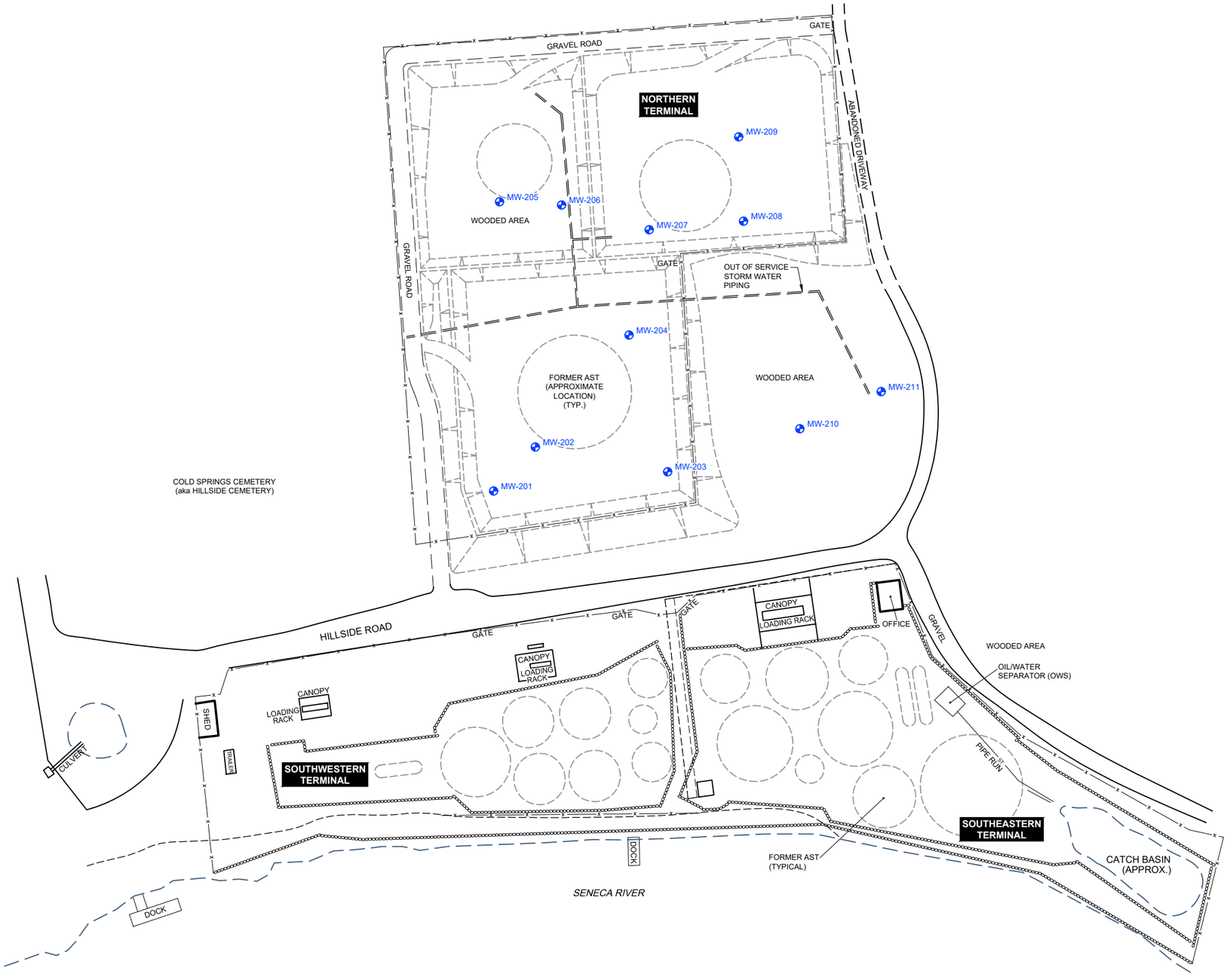
X-Base Map



LEGEND:

- MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK
NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

SITE MAP WITH MONITORING WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig3-Site Map MW.dwg LAYOUT: 3 SAVED: 9/6/2018 12:47 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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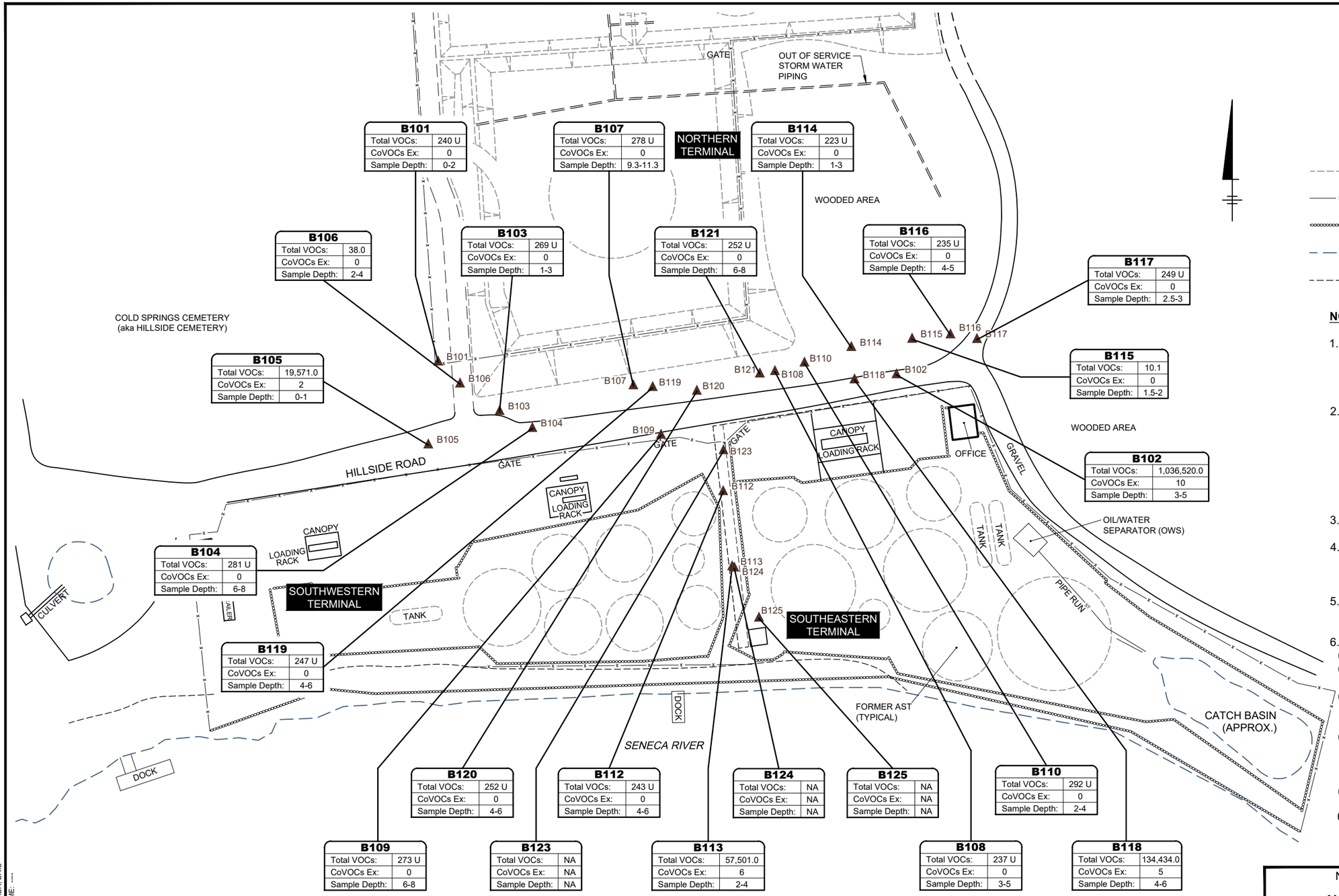
N-Title Block
X-Base Map



B101	
Total VOCs:	240 U
CoVOCs Ex:	0
Sample Depth:	0-2

B102	
Total VOCs:	1,036,520.0
CoVOCs Ex:	10
Sample Depth:	3-5

B103	
Total VOCs:	269 U
CoVOCs Ex:	0
Sample Depth:	1-3

B104	
Total VOCs:	281 U
CoVOCs Ex:	0
Sample Depth:	6-8

B105	
Total VOCs:	19,571.0
CoVOCs Ex:	2
Sample Depth:	0-1

B106	
Total VOCs:	38.0
CoVOCs Ex:	0
Sample Depth:	2-4

B107	
Total VOCs:	278 U
CoVOCs Ex:	0
Sample Depth:	9.3-11.3

B108	
Total VOCs:	237 U
CoVOCs Ex:	0
Sample Depth:	3-5

B109	
Total VOCs:	273 U
CoVOCs Ex:	0
Sample Depth:	6-8

B110	
Total VOCs:	292 U
CoVOCs Ex:	0
Sample Depth:	2-4

B112	
Total VOCs:	243 U
CoVOCs Ex:	0
Sample Depth:	4-6

B113	
Total VOCs:	57,501.0
CoVOCs Ex:	6
Sample Depth:	2-4

B114	
Total VOCs:	223 U
CoVOCs Ex:	0
Sample Depth:	1-3

B115	
Total VOCs:	10.1
CoVOCs Ex:	0
Sample Depth:	1.5-2

B116	
Total VOCs:	235 U
CoVOCs Ex:	0
Sample Depth:	4-5

B117	
Total VOCs:	249 U
CoVOCs Ex:	0
Sample Depth:	2.5-3

B118	
Total VOCs:	134,434.0
CoVOCs Ex:	5
Sample Depth:	4-6

B119	
Total VOCs:	247 U
CoVOCs Ex:	0
Sample Depth:	4-6

B120	
Total VOCs:	252 U
CoVOCs Ex:	0
Sample Depth:	4-6

B121	
Total VOCs:	252 U
CoVOCs Ex:	0
Sample Depth:	6-8

B123	
Total VOCs:	NA
CoVOCs Ex:	NA
Sample Depth:	NA

B124	
Total VOCs:	NA
CoVOCs Ex:	NA
Sample Depth:	NA

B125	
Total VOCs:	NA
CoVOCs Ex:	NA
Sample Depth:	NA

LEGEND:

- SOIL BORING
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE. LOCATION OF SOIL BORINGS (B122-B125) WERE SURVEYED ON JUNE 7, 2018.
3. NO LOCATION B111 AND B122.
4. ALL CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (µg/kg), WHICH IS EQUIVALENT TO PARTS PER BILLION (ppb).
5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
6. ABBREVIATIONS:
   - 6.1. AST = ABOVE GROUND STORAGE TANK
   - 6.2. CoVOCs Ex = COUNT OF VOCs EXCEEDANCES
   - 6.3. NA = NOT ANALYZED/NOT APPLICABLE (B123-B125 WERE ANALYZED FOR LEAD ONLY)
   - 6.4. U = INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED. VALUE SHOWN IS THE SUM OF THE REPORTING LIMIT.
   - 6.5. VOC = VOLATILE ORGANIC COMPOUND

0 80' 160'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

MAXIMUM TOTAL VOCs (SOIL) UNSATURATED ZONE - B101 - B125

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FIGURE 4

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: TR: R. HENSEL LYR:(OptON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWGN-FISR_Fig4_VOCs Unsat DB.dwg LAYOUT: 4 SAVED: 9/6/2018 1:06 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB
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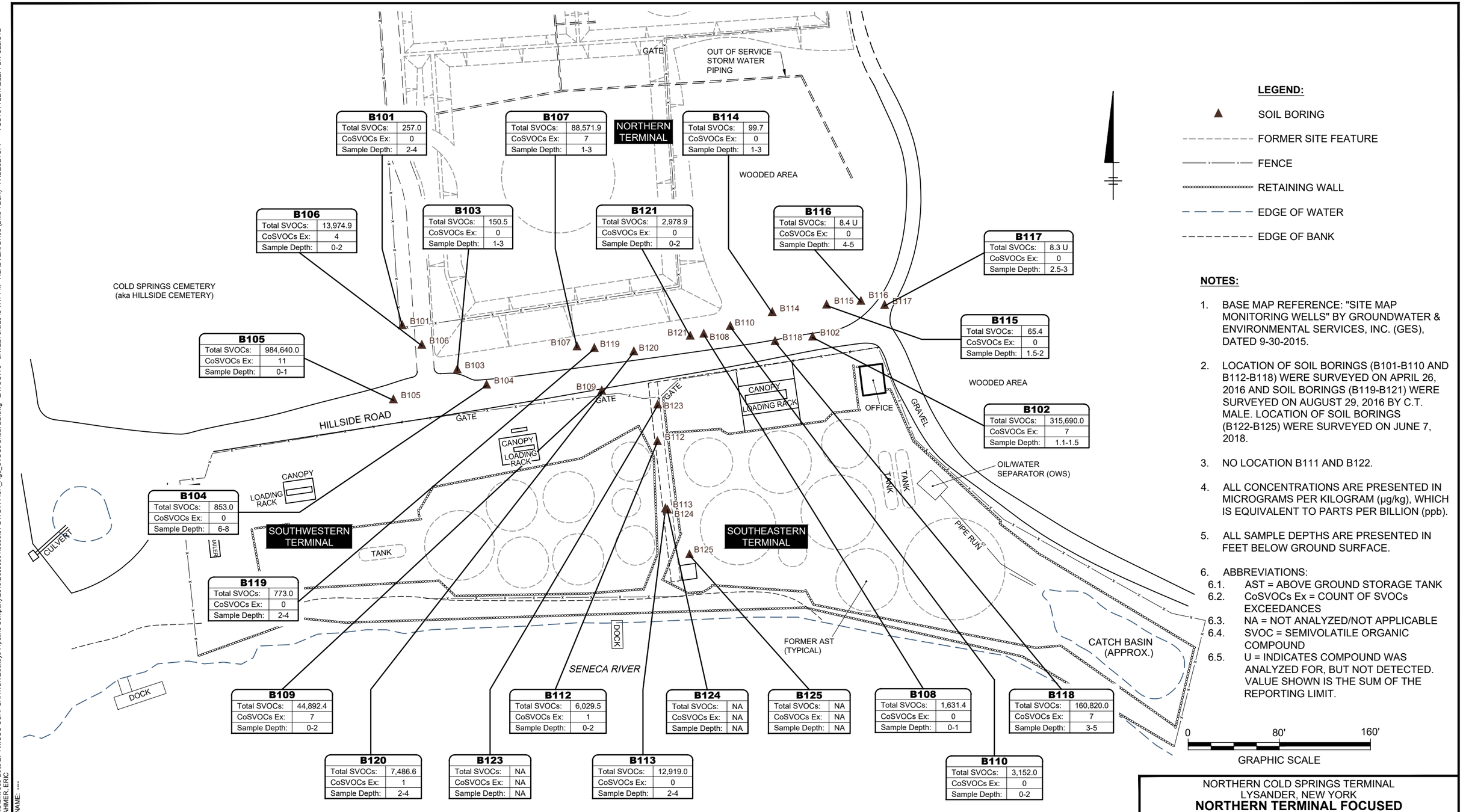
X-Base Map



LEGEND:

- ▲ SOIL BORING
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE. LOCATION OF SOIL BORINGS (B122-B125) WERE SURVEYED ON JUNE 7, 2018.
3. NO LOCATION B111 AND B122.
4. ALL CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (µg/kg), WHICH IS EQUIVALENT TO PARTS PER BILLION (ppb).
5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
6. ABBREVIATIONS:
   - 6.1. AST = ABOVE GROUND STORAGE TANK
   - 6.2. CoSVOCs Ex = COUNT OF SVOCs EXCEEDANCES
   - 6.3. NA = NOT ANALYZED/NOT APPLICABLE
   - 6.4. SVOC = SEMIVOLATILE ORGANIC COMPOUND
   - 6.5. U = INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED. VALUE SHOWN IS THE SUM OF THE REPORTING LIMIT.

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

MAXIMUM TOTAL SVOCs (SOIL) UNSATURATED ZONE - B101 - B125

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: TR: R. HENSEL LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig5_SVOCs Unsat DB.dwg LAYOUT: 5 SAVED: 9/6/2018 1:17 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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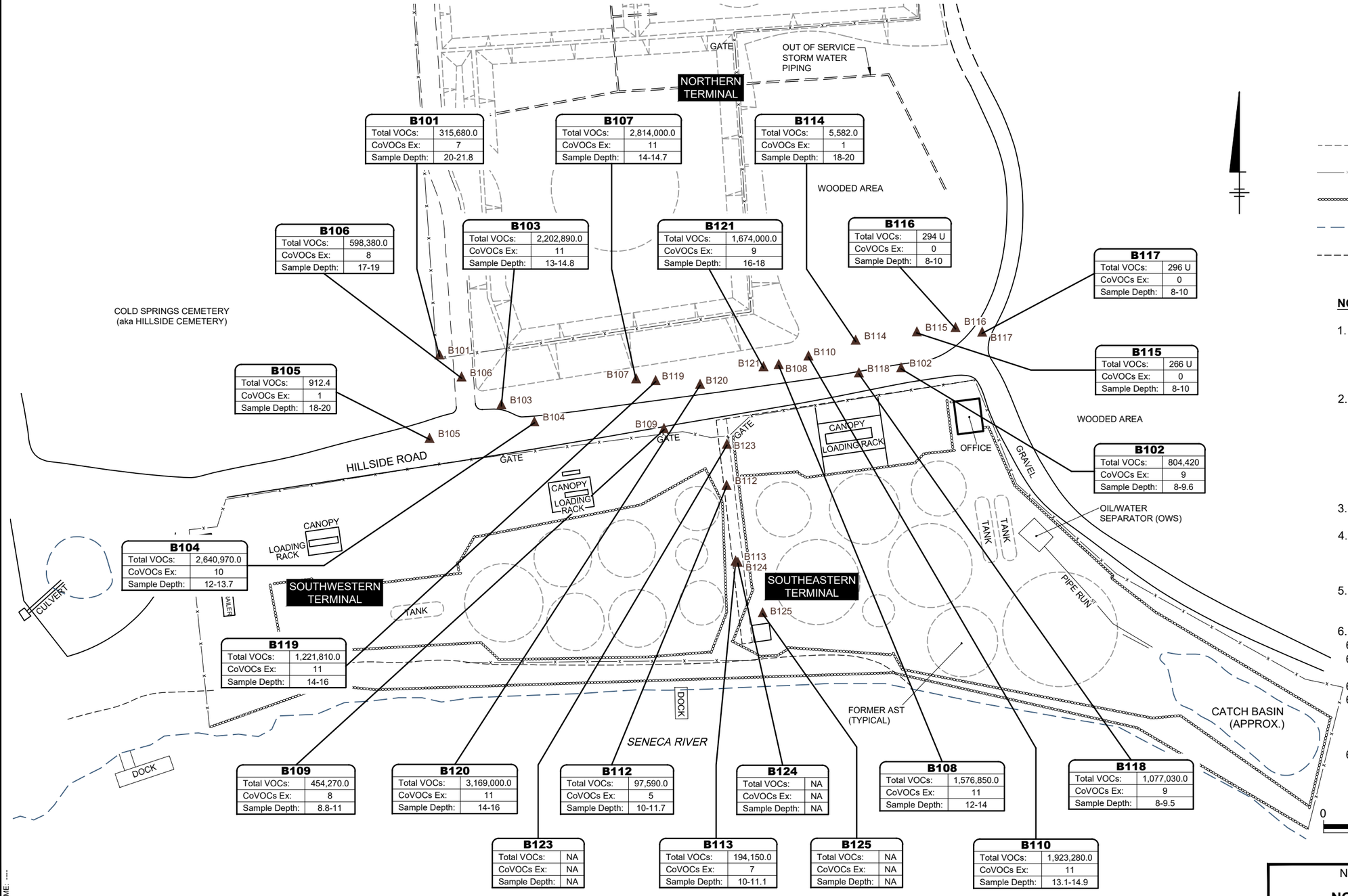
N-Title Block
X-Base Map



LEGEND:

- SOIL BORING
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE. LOCATIONS OF SOIL BORINGS (B122-B125) WERE SURVEYED ON JUNE 7, 2018.
3. NO LOCATION B111 AND B122.
4. ALL CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (µg/kg), WHICH IS EQUIVALENT TO PARTS PER BILLION (ppb).
5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
6. ABBREVIATIONS:
   - 6.1. AST = ABOVE GROUND STORAGE TANK
   - 6.2. CoVOCs Ex = COUNT OF VOCs EXCEEDANCES
   - 6.3. NA = NOT ANALYZED/NOT APPLICABLE
   - 6.4. U = INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED. VALUE SHOWN IS THE SUM OF THE REPORTING LIMIT.
   - 6.5. VOC = VOLATILE ORGANIC COMPOUND

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

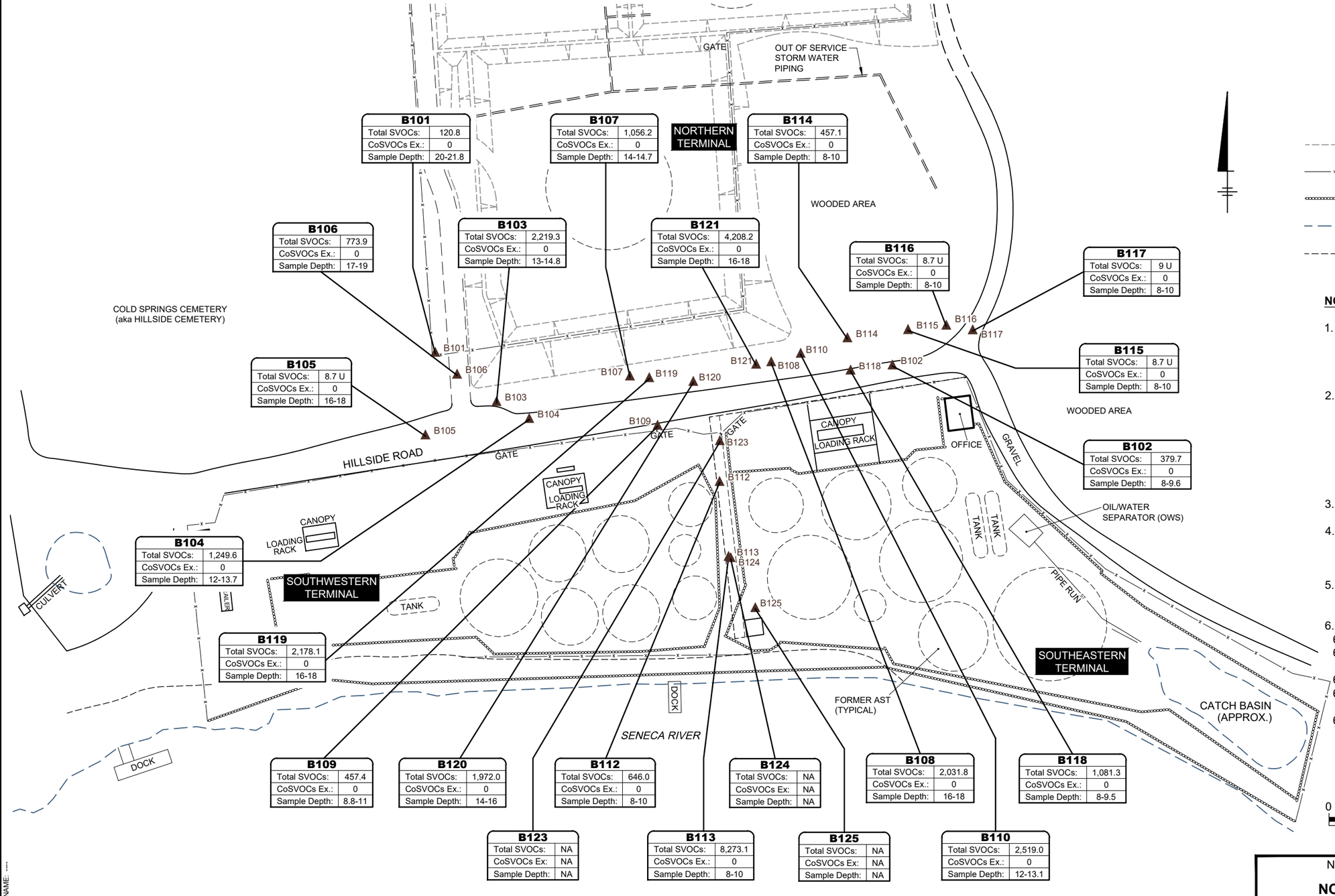
NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

MAXIMUM TOTAL VOCs (SOIL) SATURATED ZONE - B101 - B125

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: TR: R. HENSEL LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig6_VOCs Sat DB.dwg LAYOUT: 6 SAVED: 9/6/2018 1:21 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 9/6/2018 1:22 PM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
N-Title Block
X-Base Map



B101	
Total SVOCs:	120.8
CoSVOCs Ex.:	0
Sample Depth:	20-21.8

B107	
Total SVOCs:	1,056.2
CoSVOCs Ex.:	0
Sample Depth:	14-14.7

B114	
Total SVOCs:	457.1
CoSVOCs Ex.:	0
Sample Depth:	8-10

B106	
Total SVOCs:	773.9
CoSVOCs Ex.:	0
Sample Depth:	17-19

B103	
Total SVOCs:	2,219.3
CoSVOCs Ex.:	0
Sample Depth:	13-14.8

B121	
Total SVOCs:	4,208.2
CoSVOCs Ex.:	0
Sample Depth:	16-18

B116	
Total SVOCs:	8.7 U
CoSVOCs Ex.:	0
Sample Depth:	8-10

B117	
Total SVOCs:	9 U
CoSVOCs Ex.:	0
Sample Depth:	8-10

B105	
Total SVOCs:	8.7 U
CoSVOCs Ex.:	0
Sample Depth:	16-18

B115	
Total SVOCs:	8.7 U
CoSVOCs Ex.:	0
Sample Depth:	8-10

B102	
Total SVOCs:	379.7
CoSVOCs Ex.:	0
Sample Depth:	8-9.6

B104	
Total SVOCs:	1,249.6
CoSVOCs Ex.:	0
Sample Depth:	12-13.7

B119	
Total SVOCs:	2,178.1
CoSVOCs Ex.:	0
Sample Depth:	16-18

B109	
Total SVOCs:	457.4
CoSVOCs Ex.:	0
Sample Depth:	8.8-11

B120	
Total SVOCs:	1,972.0
CoSVOCs Ex.:	0
Sample Depth:	14-16

B112	
Total SVOCs:	646.0
CoSVOCs Ex.:	0
Sample Depth:	8-10

B124	
Total SVOCs:	NA
CoSVOCs Ex:	NA
Sample Depth:	NA

B108	
Total SVOCs:	2,031.8
CoSVOCs Ex.:	0
Sample Depth:	16-18

B118	
Total SVOCs:	1,081.3
CoSVOCs Ex.:	0
Sample Depth:	8-9.5

B123	
Total SVOCs:	NA
CoSVOCs Ex:	NA
Sample Depth:	NA

B113	
Total SVOCs:	8,273.1
CoSVOCs Ex.:	0
Sample Depth:	8-10

B125	
Total SVOCs:	NA
CoSVOCs Ex:	NA
Sample Depth:	NA

B110	
Total SVOCs:	2,519.0
CoSVOCs Ex.:	0
Sample Depth:	12-13.1

LEGEND:

- SOIL BORING
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE. LOCATIONS OF SOIL BORINGS (B122-B125) WERE SURVEYED ON JUNE 7, 2018.
3. NO LOCATION B111 AND B122.
4. ALL CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (µg/kg), WHICH IS EQUIVALENT TO PARTS PER BILLION (ppb).
5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
6. ABBREVIATIONS:
   - 6.1. AST = ABOVE GROUND STORAGE TANK
   - 6.2. CoSVOCs Ex = COUNT OF SVOCs EXCEEDANCES
   - 6.3. NA = NOT ANALYZED/NOT APPLICABLE
   - 6.4. SVOC = SEMIVOLATILE ORGANIC COMPOUND
   - 6.5. U = INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED. VALUE SHOWN IS THE SUM OF THE REPORTING LIMIT.

0 80' 160'

GRAPHIC SCALE

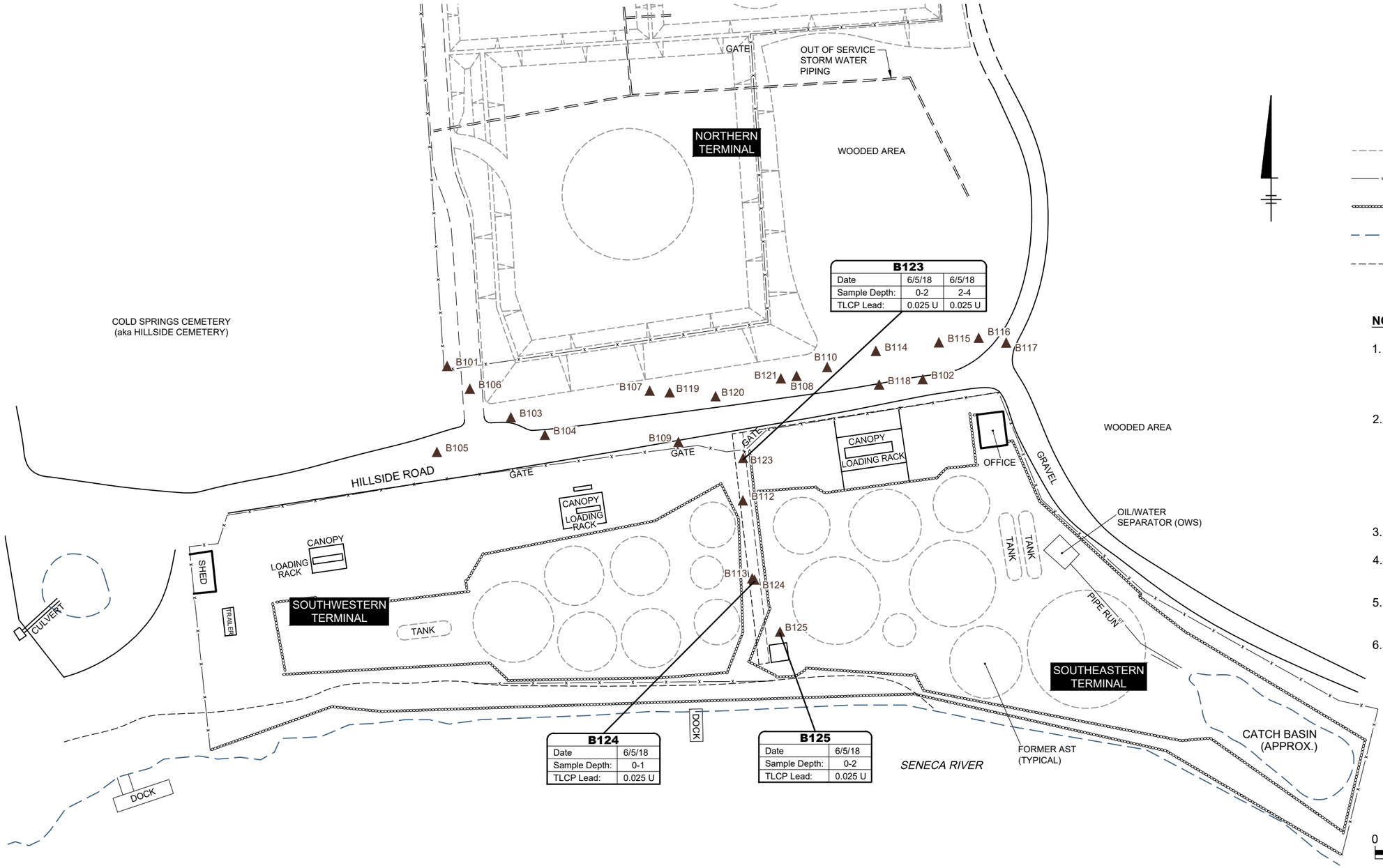
NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

MAXIMUM TOTAL SVOCs (SOIL) SATURATED ZONE - B101 - B125

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7



B123		
Date	6/5/18	6/5/18
Sample Depth:	0-2	2-4
TLCP Lead:	0.025 U	0.025 U

B124	
Date	6/5/18
Sample Depth:	0-1
TLCP Lead:	0.025 U

B125	
Date	6/5/18
Sample Depth:	0-2
TLCP Lead:	0.025 U

LEGEND:

- SOIL BORING
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE. LOCATIONS OF SOIL BORINGS (B123-B125) WERE SURVEYED ON JUNE 7, 2018.
3. NO LOCATION B111 AND B122.
4. ALL CONCENTRATIONS ARE PRESENTED IN MILLIGRAMS PER LITER (mg/L).
5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
6. AST = ABOVE GROUND STORAGE TANK

0 80' 160'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

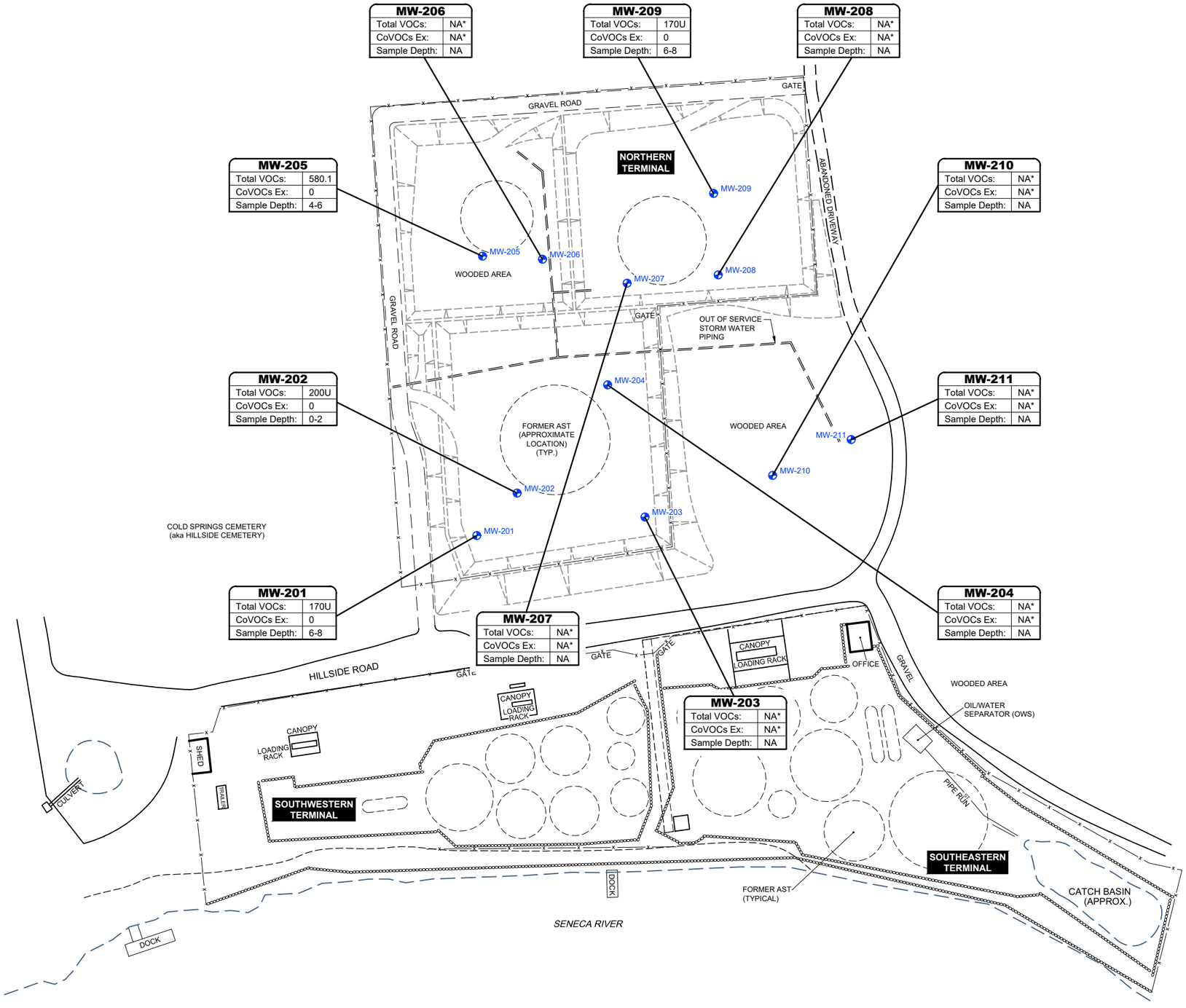
NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

TCLP LEAD (SOIL) - B123 - B125

ARCADIS Design & Consultancy for natural and built assets

FIGURE 8

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: TR: R. HENSEL LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FIGR_Fig8_Lead DB.dwg LAYOUT: 8 SAVED: 9/6/2018 1:28 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 9/6/2018 1:28 PM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
N-Title Block
X-Base Map



LEGEND:

- MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.
4. ALL CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (µg/kg), WHICH IS EQUIVALENT TO PARTS PER BILLION (ppb).
5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
6. ABBREVIATIONS:
   - 6.1. AST = ABOVE GROUND STORAGE TANK
   - 6.2. CoVOCs Ex = COUNT OF VOCs EXCEEDANCES
   - 6.3. NA = NOT ANALYZED/NOT APPLICABLE
   - 6.4. NA* = UNSATURATED ZONE SAMPLE NOT COLLECTED BASED ON FIELD PID SCREENING RESULTS INDICATING NO EVIDENCE OF IMPACTS ABOVE 50 ppmv.
   - 6.5. U = INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED. VALUE SHOWN IS THE SUM OF THE REPORTING LIMIT.
   - 6.6. VOC = VOLATILE ORGANIC COMPOUND

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

MAXIMUM TOTAL VOCs (SOIL) UNSATURATED ZONE - MW-201 - MW-211

ARCADIS Design & Consultancy for natural and built assets

FIGURE 9

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FIGS\R_Fig9_VOCs Unsat Soil.dwg LAYOUT: 9 SAVED: 8/27/2018 10:31 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB
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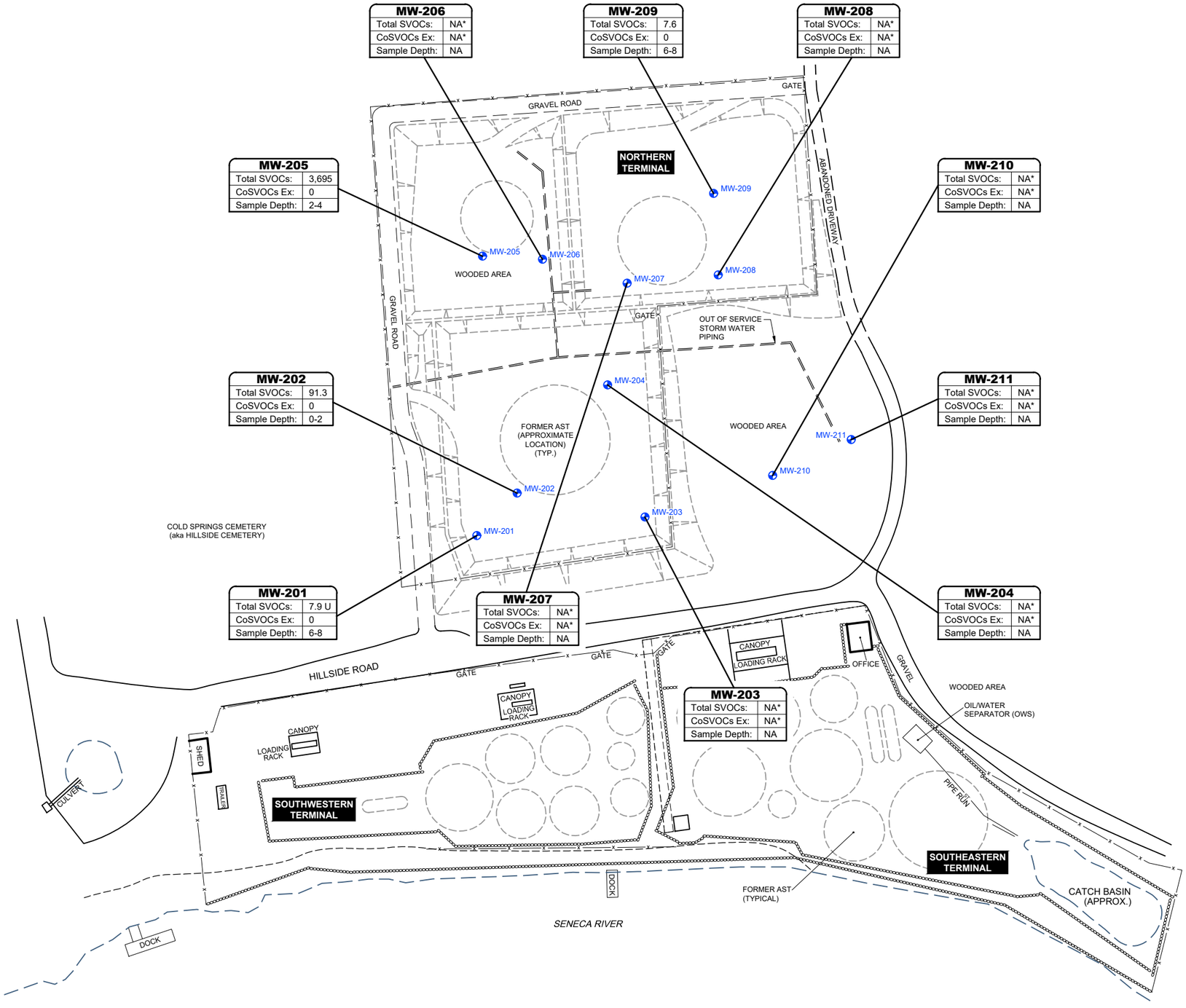
X-Base Map



LEGEND:

- MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.
4. ALL CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (µg/kg), WHICH IS EQUIVALENT TO PARTS PER BILLION (ppb).
5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
6. ABBREVIATIONS:
   - 6.1. AST = ABOVE GROUND STORAGE TANK
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   - 6.3. NA = NOT ANALYZED/NOT APPLICABLE
   - 6.4. NA* = UNSATURATED ZONE SAMPLE NOT COLLECTED BASED ON FIELD PID SCREENING RESULTS INDICATING NO EVIDENCE OF IMPACTS ABOVE 50 ppmv.
   - 6.5. SVOC = SEMI-VOLATILE ORGANIC COMPOUND
   - 6.6. U = INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED. VALUE SHOWN IS THE SUM OF THE REPORTING LIMIT.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

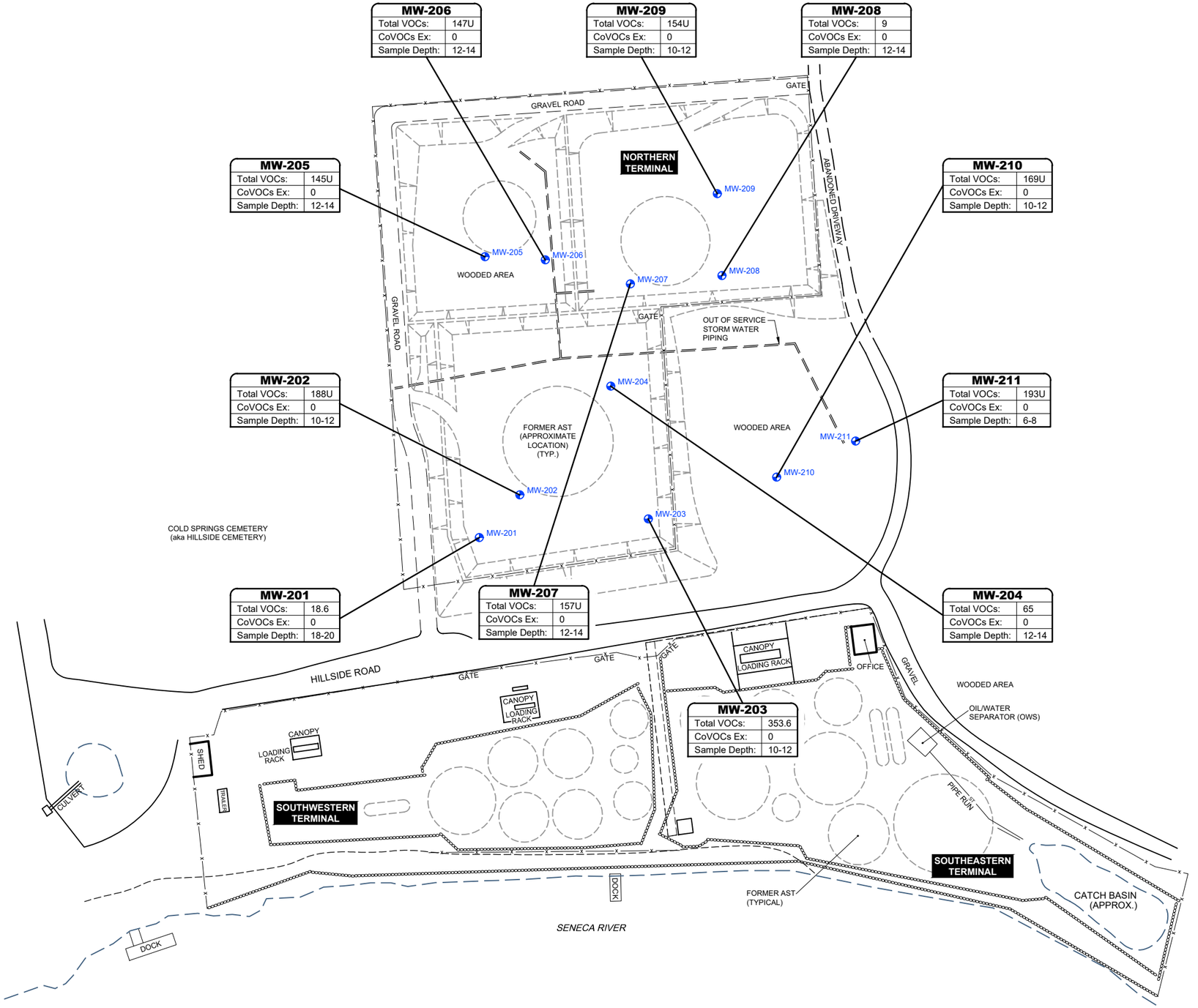
NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

MAXIMUM TOTAL SVOCs (SOIL) UNSATURATED ZONE - MW-201 - MW-211

ARCADIS Design & Consultancy for natural and built assets

FIGURE 10

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig10_SVOCs Unsat Soil.dwg LAYOUT: 10 SAVED: 9/6/2018 1:48 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 9/6/2018 1:48 PM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
N-Title Block
X-Base Map



LEGEND:

- MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
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3. AST = ABOVE GROUND STORAGE TANK.
4. ALL CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (µg/kg), WHICH IS EQUIVALENT TO PARTS PER BILLION (ppb).
5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
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   - 6.3. NA = NOT ANALYZED/NOT APPLICABLE
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   - 6.5. VOC = VOLATILE ORGANIC COMPOUND

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

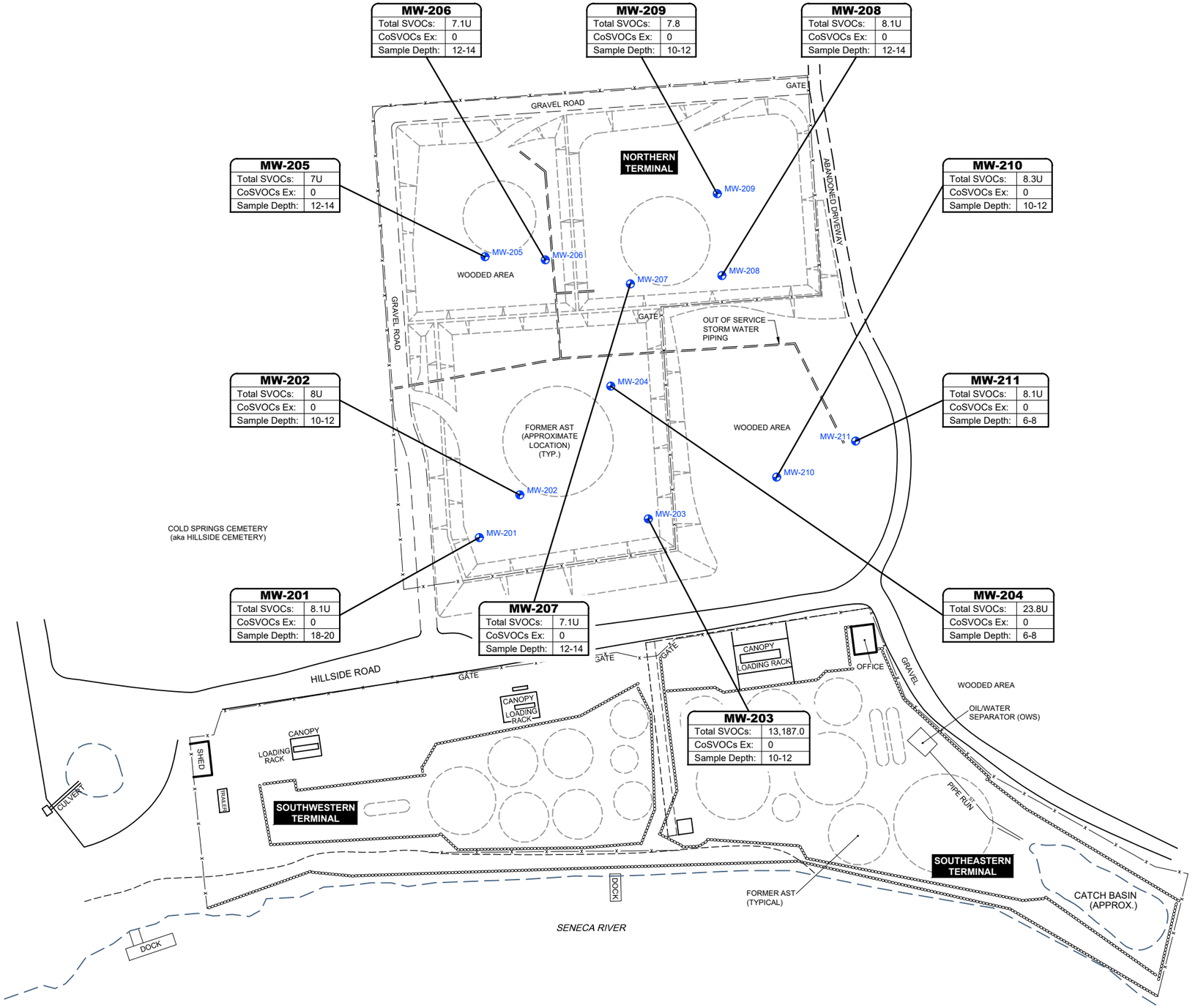
NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

MAXIMUM TOTAL VOCs (SOIL) SATURATED ZONE - MW-201 - MW-211

ARCADIS Design & Consultancy for natural and built assets

FIGURE 11

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig11_VOCs Sat Soil.dwg LAYOUT: 11 SAVED: 9/6/2018 1:51 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 9/6/2018 1:51 PM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
N-Title Block
X-Base Map



LEGEND:

- MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.
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5. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
6. ABBREVIATIONS:
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   - 6.4. SVOC = SEMI-VOLATILE ORGANIC COMPOUND
   - 6.5. U = INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED. VALUE SHOWN IS THE SUM OF THE REPORTING LIMIT.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

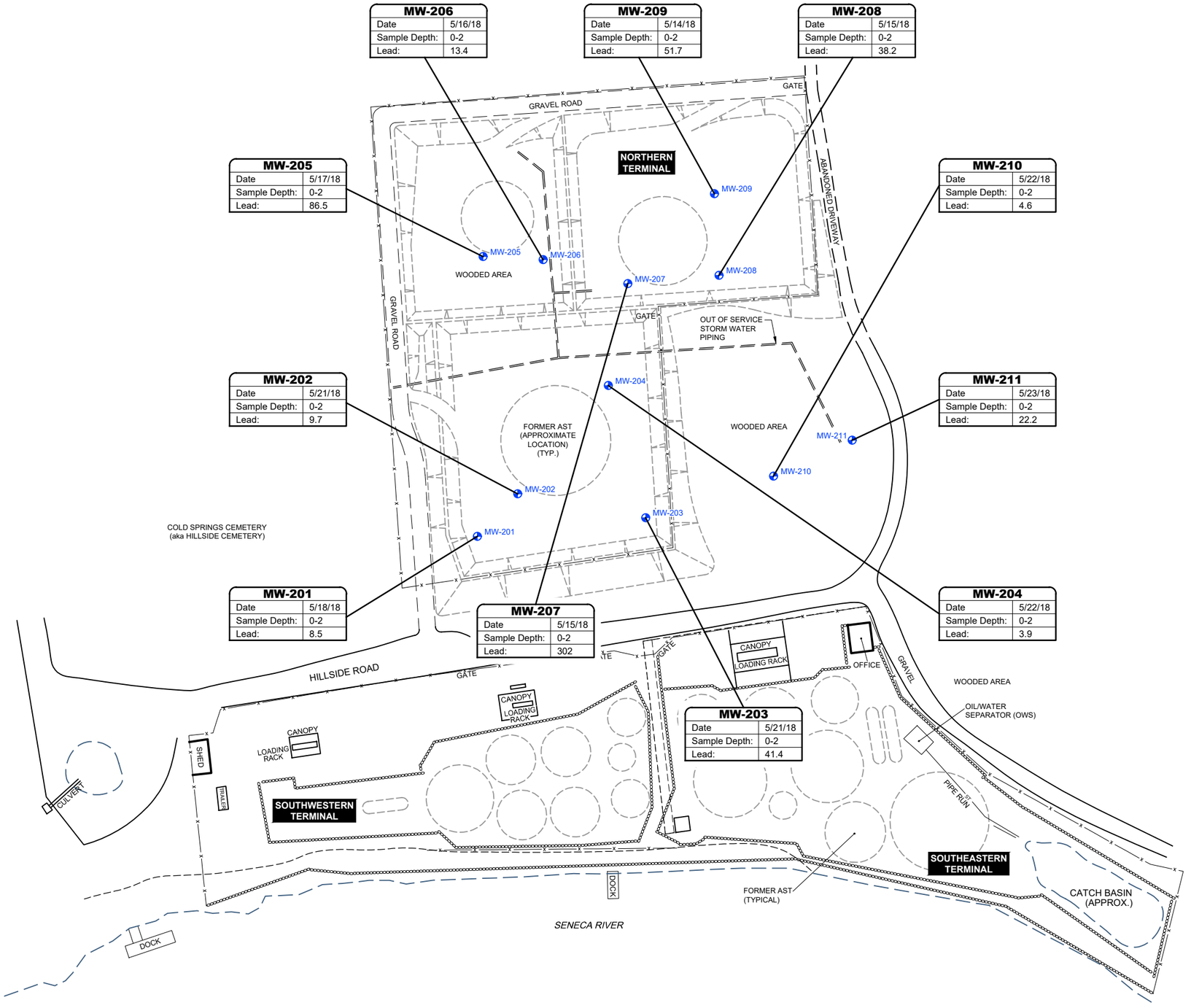
NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

MAXIMUM TOTAL SVOCs (SOIL) SATURATED ZONE - MW-201 - MW-211

ARCADIS Design & Consultancy for natural and built assets

FIGURE 12

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig12_SVOCs Sat Soil.dwg LAYOUT: 12 SAVED: 9/6/2018 1:56 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 9/6/2018 1:57 PM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
N-Title Block
X-Base Map



LEGEND:

- MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
3. ALL CONCENTRATIONS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
4. ALL SAMPLE DEPTHS ARE PRESENTED IN FEET BELOW GROUND SURFACE.
5. AST = ABOVE GROUND STORAGE TANK

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

LEAD (SOIL) - MW-201 - MW-211

ARCADIS Design & Consultancy for natural and built assets

FIGURE 13

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig13_Lead Soil.dwg LAYOUT: 13 SAVED: 9/6/2018 1:59 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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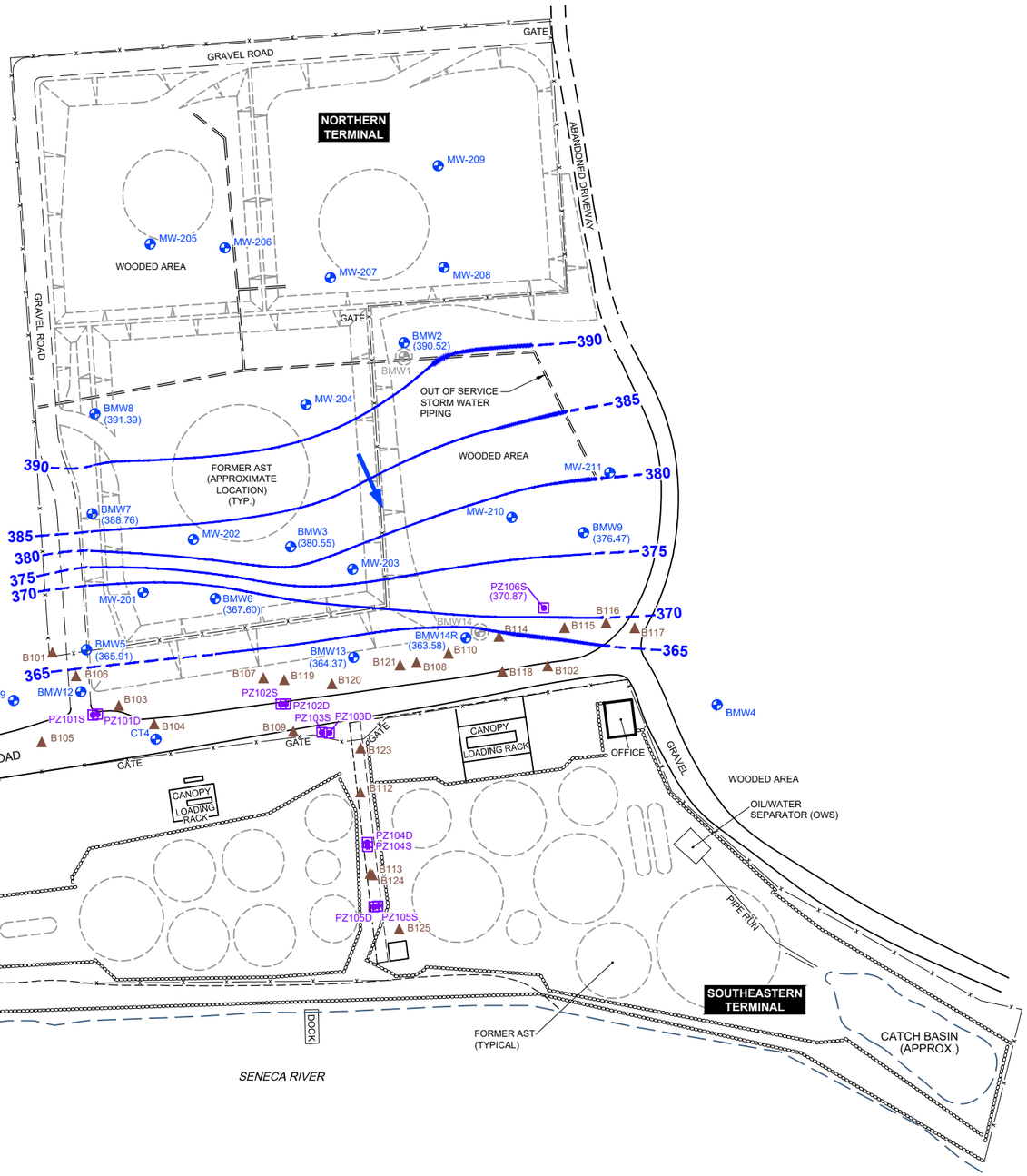
XREFS: IMAGES:
N-Title Block
X-Base Map



LEGEND:

- MONITORING WELL
- PIEZOMETER
- SOIL BORING
- DECOMMISSIONED MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK
- 375 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- (391.39) GROUNDWATER ELEVATION (FT AMSL)
- GROUNDWATER FLOW DIRECTION (APPROXIMATE)

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE. LOCATION OF MONITORING WELLS (MW-201-MW-210), AND SOIL BORINGS (B122-B125) WERE SURVEYED ON JUNE 7, 2018.
3. NO LOCATION B111 AND B122.
4. AST = ABOVE GROUND STORAGE TANK.
5. BMW14R GAUGED AND SAMPLED AUGUST 6, 2018.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK
NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

GROUNDWATER CONTOUR - MAY 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 14

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E.KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(OptjON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig14_GW CONT MAY 2018.dwg LAYOUT: 14 SAVED: 9/6/2018 2:02 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE:
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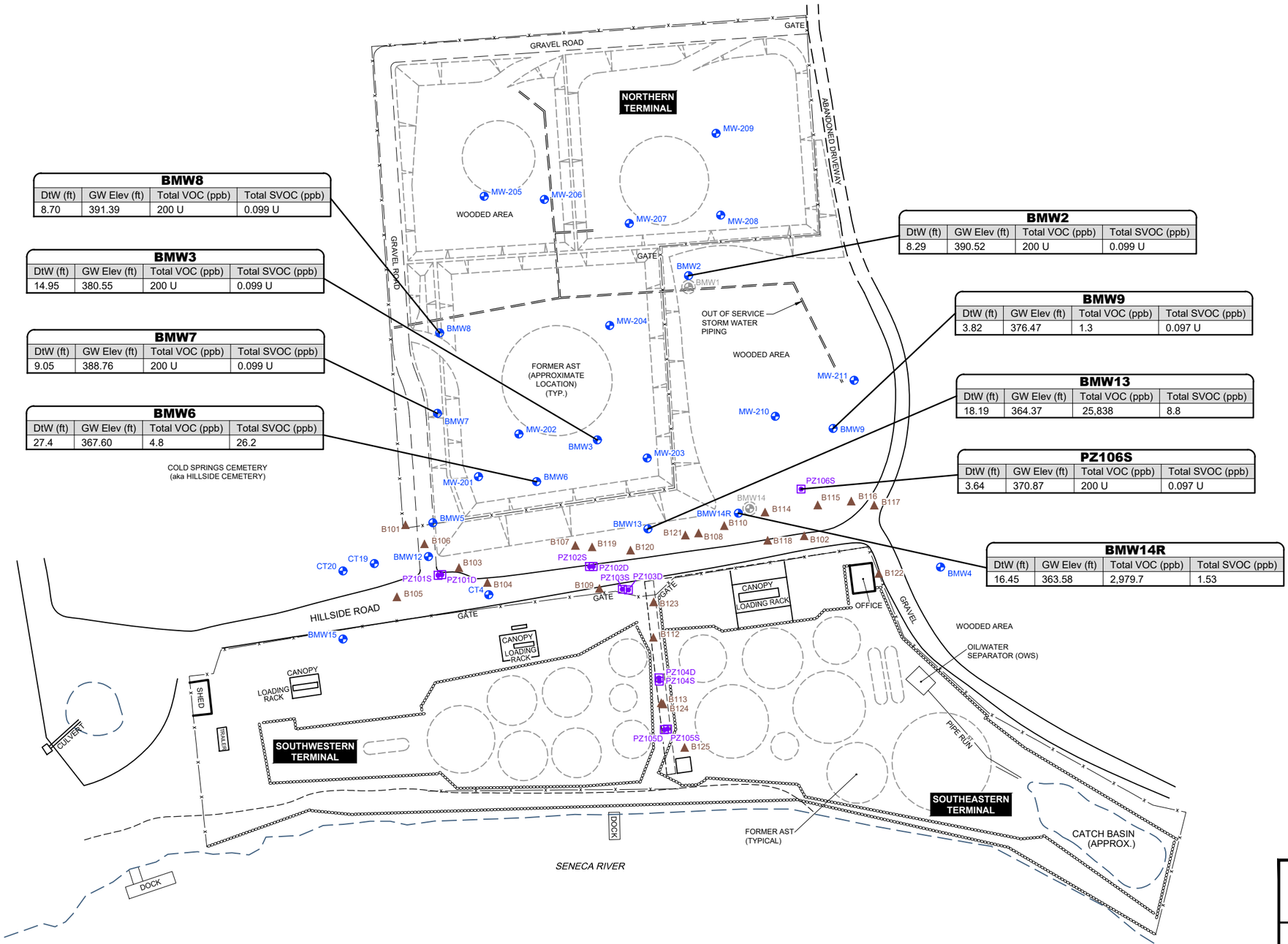
XREFS: IMAGES: PROJECTNAME: ----
N-Title Block
X-Base Map



BMW8

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
8.70	391.39	200 U	0.099 U

BMW3

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
14.95	380.55	200 U	0.099 U

BMW7

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
9.05	388.76	200 U	0.099 U

BMW6

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
27.4	367.60	4.8	26.2

BMW2

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
8.29	390.52	200 U	0.099 U

BMW9

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
3.82	376.47	1.3	0.097 U

BMW13

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
18.19	364.37	25,838	8.8

PZ106S

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
3.64	370.87	200 U	0.097 U

BMW14R

DtW (ft)	GW Elev (ft)	Total VOC (ppb)	Total SVOC (ppb)
16.45	363.58	2,979.7	1.53

LEGEND:

- MONITORING WELL
- PIEZOMETER
- SOIL BORING
- DECOMMISSIONED MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

DtW	DEPTH TO WATER
ft	FEET
NA	NOT ANALYZED
ppb	PARTS PER BILLION
SVOC	SEMIVOLATILE ORGANIC COMPOUNDS
VOC	VOLATILE ORGANIC COMPOUNDS

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE. LOCATION OF MONITORING WELLS (MW-201-MW-210), AND SOIL BORINGS (B122-B125) WERE SURVEYED ON JUNE 7, 2018. BMW14R WAS SURVEYED AUGUST 8, 2018.
3. NO LOCATION B111 AND B122.
4. ABBREVIATIONS:
   - 4.1. AST = ABOVE GROUND STORAGE TANK
   - 4.2. U = INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED. VALUE SHOWN IS THE SUM OF THE REPORTING LIMIT.
5. BMW5 - NO PRODUCT WAS DETECTED IN THE FIELD BUT THE LAB INDICATED PETROLEUM WAS FOUND IN THE SAMPLE AND IT COULD NOT BE ANALYZED.
6. BMW14R WAS GAUGED AND SAMPLED AUGUST 6, 2018.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK
NORTHERN TERMINAL FOCUSED INVESTIGATION SUMMARY REPORT

TOTAL VOC AND SVOC (GROUNDWATER) - MAY 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 15

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E.KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(OptiON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B0090004.0006\01-DWG\N-FISR_Fig15_VOC SVOC GW.dwg LAYOUT: 15 SAVED: 8/27/2018 11:36 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 9/6/2018 2:08 PM BY: KRAHMER, ERIC PROJECTNAME: ----
XREFS: IMAGES:
N-Title Block
X-Base Map

APPENDIX 1

February 2016 Focused Investigation Work Plan, February 2018 Supplemental Characterization and Interim Remedial Action Work Plan, and NYSDEC Approval of 2018 Work Plan

February 2016 Focused Investigation Work Plan

ARCADIS Design & Consultancy for natural and built assets

Richard Brazell, PE
Region 7 Regional Spill Engineer
New York State Department of Environmental Conservation
615 Erie Blvd. West
Syracuse, New York 13204

Arcadis of New York, Inc.
6723 Towpath Road
PO Box 66
Syracuse
New York 13214-0066
Tel 315 446 9120
Fax 315 449 0017
www.arcadis.com

Subject:
Focused Investigation Work Plan
Hillside Road, Northern Terminal Study Area,
Lysander, New York

ENVIRONMENT

Date:
February 22, 2016

Contact:
Vin Maresco

Phone:
315 671 9256

Email:
vin.maresco@arcadis.com

Our ref:
B0090004.0001

Dear Mr. Brazell:

Arcadis U.S., Inc. (Arcadis) has prepared this Focused Investigation Work Plan (Work Plan) for the Northern Cold Springs Terminal (the Northern Terminal) on behalf of Buckeye and BP. The purpose of this Work Plan is to collect and evaluate data to assist in determining remedial options and strategies for the Northern Terminal. The specific objective of the work described in this Work Plan is to better define subsurface stratigraphy, assess the nature and extent subsurface impacts within these focus areas, and study the groundwater-surface water interaction at the Site. This work plan proposes drilling soil borings and collecting soil samples for analytical testing, installing nested discretely-screened piezometers, and water-level monitoring. A detailed description of these activities is provided below. The activities will be conducted in accordance with New York State Department of Environmental Conservation (NYSDEC) Department of Environmental Remediation DER-10 (May 2010).

Areas of Investigation

To facilitate a focused remedial effort, the Work Plan has been broken into four distinctive study areas based on the location of known spills and the results of previous investigations (see Figure 1). These areas are as follows:

- Area 1 – Area proximal to monitoring well BMW5
- Area 2 – Former transfer pump area
- Area 3 – Delivery line right of way (ROW) between the two southern terminals
- Area 4 – Area proximal to monitoring well B18

1. Pre-Investigation Activities

Prior to initiating drilling activities public utilities will be marked out by contacting Dig Safely New York to locate and mark all utilities near the areas of investigation. A private utility locator will be also be contracted to provide additional utility mark out in the proposed areas of investigation. In accordance with Arcadis subsurface clearance policy, each drilling location will also be hand-cleared to a minimum of 5 feet below ground surface (bgs) before drilling.

Based on information learned from previous site investigations and available historic facility maps, there are three suspected distributions lines that run north-south though Area 3. These distribution lines will be uncovered by hand or soft digging methods at three separate points (northern, middle and southern regions) to visually verify their location, orientation, and direction. Proposed sample locations may be adjusted in an east/west direction based on proximity to utilities.

2. Soil Boring and Sampling Activities

This Work Plan proposes a total of 18 soil borings and installation of 6 nested piezometer pairs (B-101 through B-118 and PZ-101S/D though PZ-106S/D) throughout the four areas proposed for investigation (see Figure 2). Soil borings will be advanced using direct-push drilling methods. Soil samples will be continuously collected from grade to terminal depth using 2-inch diameter 4 or 5-foot long macrocores liners. Representative soils samples will be collected approximately every 2-feet and screened for volatile organic compounds (VOC) using a photo-ionization detector (PID). Soil characteristics will be logged continuously by a geologist for texture, grains size, moisture content, geologic origin, and the potential presence of impacts via field instrumentation. Each boring termination depth will be determined in the field by the on-site geologist and will be based on field indication of absence of impacts or 10 feet below first detection of the water table, whichever is shallower. For the purposes of this investigation field determination of absence of impact will be a detection of 50ppm on a field PID or less. Based on a review of historical data the anticipated terminal depth of each boring is estimated as follows:

Area 1 – Seven total soil borings, four in the northern portion to approximately 30 feet bgs and three in the southern portion to approximately 20 feet bgs

Area 2 – Six soil borings to approximately 18 to 20 feet bgs

Area 3 – Five soil borings to approximately 18 to 20 feet bgs

Area 4 – Six soil borings to approximately 22 feet bgs

Soil samples will be collected from each interval and analyzed by PACE Analytical Services, Inc. in Pittsburgh PA for constituents listed in NYSDEC Policy CP-51: Tables 2 and 3 (Soil Cleanup Levels for Gasoline and Fuel Oil Contaminated Soils, respectively). Samples will also be analyzed for methyl-tert-butyl-ether (MTBE) and ethanol.

Soil borings will be abandoned by backfilling each borehole with pelletized bentonite while removing the drilling tools. Soil cuttings generated during soil sampling activities will be temporally contained in 55-gallon drums on site in the northern portion of investigation Area 4. Composite samples of generated waste material will be collected for waste characterization analysis in accordance with applicable laws and regulations. All waste will be disposed of at an off-site location based on the results of laboratory analytical testing.

3. Groundwater/Surface water Interaction Activities

Six pairs of nested piezometers (PZ-101S/D through PZ-106S/D, 12 total piezometers) will be installed starting on the north side of Hillside Drive (Area 1, Area 2 and Area 4) and progressing into the ROW (Area 3), towards the Seneca River. These proposed locations are shown on Figure 3. Water-levels will be measured in the piezometers to better understand the groundwater-to-surface water interaction.

The soil borings for each of the piezometers will be drilled using the direct-push drilling procedure described above or a hollow stem auger rotary method. Piezometers will be constructed using 2-inch inside diameter (ID) schedule 40 polyvinyl chloride (PVC) material. Shallow piezometers (PZ-101S though PZ-106S) will extend to approximately 20 feet bgs and will be constructed with a 15 foot screen intended to straddle the water table (i.e., 10 feet below the average water table elevation and 5 feet above the average water table elevation). Deeper piezometers (PZ-101D though PZ-106D) will extend to the top of the glacial till or an elevation of 345 feet above mean sea level (amsl) (whichever is shallower). The deeper piezometers will be constructed using 2-foot long screens utilizing standard well construction methods with appropriately sized clean sand pack. An approximate 5-foot bentonite seal will be placed starting at approximately 1 foot above the piezometer screen.

Automatic pressure transducers will be installed inside each piezometer and in the two staff gauges installed in the Seneca River. One staff gauge will be installed along the nearby boat dock and the other along the bulk head near Area 3. Pressure transducers will allow collection of relatively continuous water levels over a several month period. Water levels will be evaluated to assess the magnitude and direction of hydraulic gradients (i.e., groundwater flow direction) in the horizontal and vertical direction. Measure groundwater levels at the same time as the surface water level in Seneca River will enable an evaluation of groundwater interaction with the river. Transducers will be installed in the piezometers and river gauges approximately one month prior to the opening of the NYS Barge Canal system and will collect data over the course of approximately three months.

Manual water-level measurements will be obtained at piezometers and river gauges once at the beginning of the study every week thereafter. All transducers will be inspected and data will be downloaded during the manual gauging events.

4. Survey

All soil borings, piezometers, and surface water measurement locations will be surveyed by a NYS licensed surveyor relative to the datum that has been established for the site. Survey information will be used to convert depths to elevations at each boring location and to establish reference elevations for each piezometer.

5. Reporting

The results of the activities described in this Work Plan will be presented in one final report which will summarize soil boring, sampling activities, and the groundwater-surface water interaction study. The report is anticipated to include, at a minimum, the following:

- Brief narrative describing the field activities, observations, and results
- Updated site plan showing the actual locations of all soil borings and/or piezometer locations
- Soil boring and piezometer logs
- Copies of laboratory testing reports
- Hydrographs of the transducer and manual water-level measurements (groundwater-surface water interaction report, only)

6. Schedule

Ideally field activities described herein will be initiated no later than March 2016, approximately one month prior to the target NYS Canal system opening in April 2016. The installation of piezometers, transducers and initiation of the groundwater-surface water interaction study will immediately follow the completion of the drilling activities. Groundwater and surface water monitoring activities will continue for a minimum of two months after the transducers are installed. The report discussed in Section 5 above will be submitted within approximately 60 days after completion of all field activities.

If you have any questions or require additional information, please call me at 315.671.9256.

Sincerely,

Arcadis of New York, Inc.

Vincent S. Maresco
Principal Geologist

Enclosures:

Figures

1 Northern Terminal Areas of Investigation
2 Proposed Soil Boring Locations
3 Proposed Piezometer Locations

LEGEND:

- MONITORING WELL
- FORMER AST
- FENCE
- TOP OF WALL
- EDGE OF WATER
- INVESTIGATION AREA

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. AST = ABOVE GROUND STORAGE TANK.

COLD SPRINGS TERMINAL
HILLSIDE ROAD, LYSANDER, NEW YORK
FOCUSED INVESTIGATION WORK PLAN

NORTHERN TERMINAL AREAS OF INVESTIGATION

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: TR: R. HENSEL LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES: PROJECTNAME: ----
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900004X01

LEGEND:

- PROPOSED SOIL BORING
- MONITORING WELL
- FORMER AST
- FENCE
- TOP OF WALL
- EDGE OF WATER
- INVESTIGATION AREA

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. AST = ABOVE GROUND STORAGE TANK.

COLD SPRINGS TERMINAL
HILLSIDE ROAD, LYSANDER, NEW YORK
FOCUSED INVESTIGATION WORK PLAN

PROPOSED SOIL BORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: TR: R. HENSEL LYR:(Opt)ON=*;OFF=*REF*
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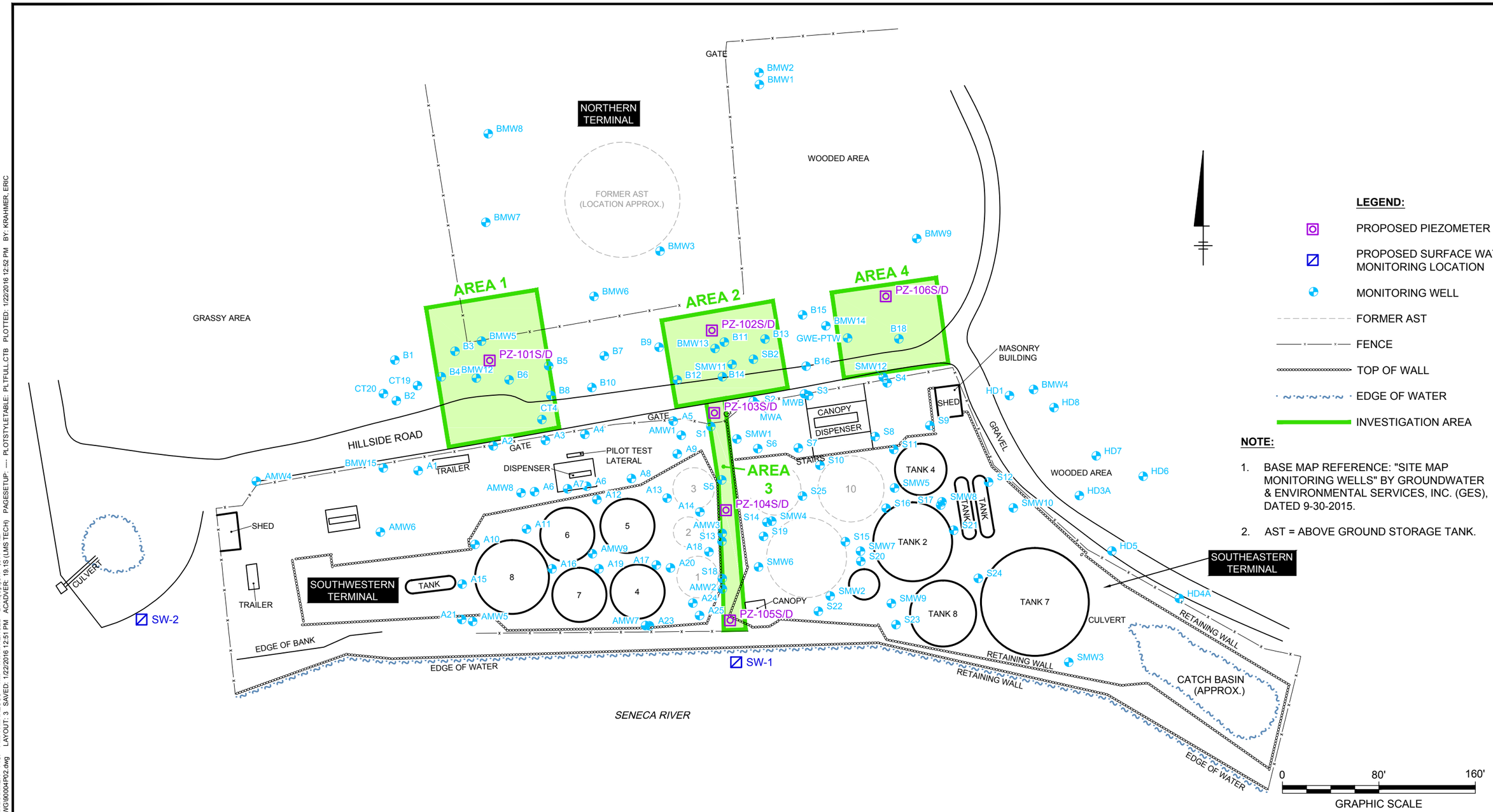

LEGEND:

- PROPOSED PIEZOMETER
- PROPOSED SURFACE WATER MONITORING LOCATION
- MONITORING WELL
- FORMER AST
- FENCE
- TOP OF WALL
- EDGE OF WATER
- INVESTIGATION AREA

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. AST = ABOVE GROUND STORAGE TANK.

COLD SPRINGS TERMINAL
HILLSIDE ROAD, LYSANDER, NEW YORK
FOCUSED INVESTIGATION WORK PLAN

PROPOSED PIEZOMETER LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: TR: R. HENSEL LYR:(Opt)ON=*;OFF=*REF*
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February 2018 Supplemental Characterization and Interim Remedial Action Work Plan

ARCADIS Design & Consultancy for natural and built assets

Northern Terminal Group

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

Hillside Road, Cold Springs Terminals
Lysander, New York

February 21, 2018

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

Hillside Road, Cold Springs Terminals,
Lysander, New York

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Principal Geologist

Prepared for:

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Our Ref.:

B0090004.0006

Date:

February 21, 2018

CONTENTS

TABLES

FIGURES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

Arcadis	Arcadis U.S., Inc.
DER-10	Department of Environmental Remediation, Technical Guidance for Site Investigation and Remediation
fbgs	feet below ground surface
LIF	Laser Induced Florescence
LNAPL	light non-aqueous phase liquid
MNA	Monitored Natural Attenuation
NAPL	non-aqueous phase liquid
NYSDEC	New York State Department of Environmental Conservation
PACE	PACE Analytical Services, Inc., Greensburg, Pennsylvania
PID	photo-ionization detector
QAPP	Quality Assurance Project Plan
VOCs	volatile organic compounds
Work Plan	Groundwater and Soil Impact Investigation Work Plan
NYS DOH	New York State Department of Health
ELAP	Environmental Laboratory Accreditation Program
TCLP	toxicity characteristic leaching procedure

1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) has prepared this Supplemental Characterization and Interim Remedial Action Work Plan (Work Plan) for the Cold Springs Terminals Site (Figure 1), on behalf of the Northern Terminal Group, in accordance with the Order on Consent effective October 19, 2017. The Work Plan also accounts for the recent demolition activities on the Southern Terminals, including the removal of aboveground tanks and piping, which now allows for further assessment of the surface and subsurface conditions in previously inaccessible areas.

The specific objectives of the work scope detailed in this Work Plan are as follows:

- Evaluate soil in areas previously unassessed.
- Provide the additional data to allow for the refining and updating of the scope of the October 1, 2015 Cold Springs Terminal Mutual Defense Group Remedial Action Work Plan (October 2015 RAWP).
- Conduct a site assessment of the Northern Terminal

To accomplish these goals, this Work Plan proposes the following tasks across both the Northern and the Southern Terminals:

Northern Terminal:

- Perform a monitoring well integrity survey on existing wells that are being used as part of the proposed site investigation activities and make repairs as needed based on findings;
- Conduct a groundwater sampling event using the existing wells;
- Installation of additional groundwater monitoring wells as proposed below;
- Completing an elevation survey of new wells;
- Conduct a comprehensive groundwater sampling event on the Northern Terminal; and,
- Data compilation, interpretation, and presentation.

Southern Terminals:

- Collect soil quality data via Laser Induced Fluorescence (LIF);
- Advance soil borings to correlate LIF findings to direct laboratory analytical samples;
- After the STG re-establishment of the performance monitoring well network, commence groundwater sampling in accordance with the October 2015 RAWP; and,
- Data compilation, interpretation, and presentation.

A detailed description of these activities is provided below. The activities will be conducted in accordance with New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation-10 (DER-10, Technical Guidance for Site Investigation and Remediation) (NYSDEC, 2010a) and, in the case of the Southern Terminal area groundwater monitoring program, per the October 2015 RAWP (Cold Springs Terminal Mutual Defense Group, 2015).

2 NORTHERN TERMINAL INVESTIGATION ACTIVITIES

2.1 Monitoring Well Integrity Assessment

A group of 11 wells currently existing on the Northern Terminal will be useful in understanding the current groundwater conditions of the Northern Terminal. These wells are listed on Table 1 and are depicted on Figure 2.

The first field action will be a monitoring well integrity survey of all existing Northern Terminal wells. This will be performed to assess the need for monitoring well repair, development, or replacement. The integrity survey will include the following:

- The overall condition of the well (labeled; condition of the well protective casing or well head and well pad; integrity of the surface seals; presence of the bolting or locking well cap, J-plug inner lockable cap, inner well riser casing, and survey mark)
- The comparison of measurable quantities (e.g., riser stickup relative to grade and well total depth)
- An assessment of the bottom sediment condition via probe feel and or bailer inspection
- Confirmation that each well listed in Table 1 is part of a survey data set and has known survey coordinates and elevation
- An initial measurement of the depth to liquid in each well

A monitoring well integrity assessment form, provided as Attachment 1, will be completed for each of the existing monitoring wells in this group.

2.2 Northern Terminal Existing Wells Groundwater Gauging and Sampling Event

The Table 1-listed wells are existing wells that have been selected to assist in assessing groundwater conditions on the Northern Terminal. Following integrity inspection and any needed repairs these wells will be gauged with an interface probe. The depth to water and, if detected, non-aqueous phase liquid (NAPL) thickness will be recorded and reported. Monitoring wells that are part of the sampling program and are free of NAPL will be purged of three well volumes and subsequently sampled using disposable bailers. The groundwater quality in each well will be evaluated using a multi-parameter water quality meter for temperature (degrees Celsius), pH (Standard Units), conductivity (milli-Siemens per centimeter), DO (milligrams per liter), and ORP (milli-Volts) and will be recorded to evaluate Monitored Natural Attenuation (MNA) indicators on site.

Groundwater samples will be collected from each of the well locations in accordance with DER-10 guidelines. Samples will be analyzed for NYSDEC STARS-listed volatile organic compounds (VOCs) via EPA Method Number 8260 including oxygenates, and ethanol and for semi-volatile organic compounds (SVOC) via EPA Method 8270. In addition, collected samples will be analyzed for selected MNA indicators, including nitrate/nitrite, sulfate, dissolved methane, alkalinity, dissolved ferrous iron, dissolved manganese, and carbon dioxide. Chain-of-custody documentation will be maintained for all collected samples. Collected groundwater samples will be analyzed by PACE Analytical Services, Inc., in

Greensburg, Pennsylvania (PACE), a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program-certified (ELAP) laboratory.

One set of quality assurance/quality control samples, including a blind duplicate, matrix spike, matrix spike duplicate, and trip blanks, will be collected at a frequency of one per 20 and submitted for laboratory analysis. Purge water and any NAPL generated by the monitoring activities will be containerized in properly labeled steel 55-gallon drums for off-site disposal.

2.3 Northern Terminal Utility Mark Out

Prior to initiating subsurface disturbance activities, public utilities will be marked out by contacting Dig Safely New York to locate and mark all utilities near the areas of investigation. A private utility locator will also be contracted to provide additional utility mark out in the proposed areas of investigation. In accordance with Arcadis' subsurface clearance policy, unless variances are agreed to between various parties, each drilling location will also be hand cleared to a minimum of 5 feet below ground surface before drilling.

2.4 Northern Terminal Soil Boring and Soil Sampling Activities

Areas of the Northern Terminal will be assessed via a direct-push or hollow stem auger soil boring program followed by installation of groundwater monitoring wells, as discussed in Section 2.5 below. The locations for these proposed boring locations coincide with the proposed 11 groundwater monitoring wells proposed for the Northern Terminal, as discussed below and shown on Figure 3.

Soil borings will be advanced using direct-push or hollow stem auger sample collection methods (either macro core or split spoon methods). Soil samples will be continuously collected from grade to terminal depth using 2-inch-diameter sampling tools. Representative soils samples will be collected approximately every 2 feet and screened for VOCs using a properly calibrated photo-ionization detector (PID). Soil characteristics will be logged continuously by an Arcadis geologist for texture, grain size, moisture content, geologic description, and the potential presence of impacts as detected via field PID instrumentation. Each boring termination depth will be determined in the field by the on-site geologist and will be based on the field indication of absence of impacts or 10 feet below the first detection of the water table, whichever is shallower. For the purposes of this investigation, field determination of absence of impact will be a detection of 50 parts per million (PPM) on a field PID or less. Based on a review of historical data, the anticipated terminal depth of each boring is estimated to be less than 25 feet.

Soil samples will be collected, at a minimum, from the interval with the highest PID reading above the water table and at the water table. Additionally, depending on field conditions and observations, samples may also be collected from additional intervals at each boring. All retained samples will be analyzed by PACE for constituents listed in NYSDEC Policy CP-51: Tables 2 and 3 (Soil Cleanup Levels for Gasoline and Fuel Oil Contaminated Soils, respectively) (NYSDEC, 2010b). Samples will also be analyzed for oxygenates and ethanol. Additionally, samples from the ground surface to 2 feet below ground surface will be analyzed for total lead.

Soil cuttings generated during soil sampling activities will be temporarily contained on and covered with plastic sheeting. Composite samples of the material will be collected for characterization analysis in

accordance with applicable laws and regulations. All materials will be disposed of at an off-site location based on the results of laboratory analytical testing.

2.5 Northern Terminal Monitoring Well Installation

As discussed above, additional groundwater monitoring wells are proposed for the Northern Terminal. There are 11 monitoring wells proposed throughout the Northern Terminal study area at the locations shown on Figure 3 and coincide with the locations for the soil borings discussed in Section 2.4 above. The soil borings for each of the monitoring wells will be advanced using a hollow stem auger rotary method. Wells will be constructed using 2-inch inside-diameter, Schedule 40, polyvinyl chloride (PVC) material. Monitoring wells will be constructed with a 15-foot screen intended to straddle the water table (i.e., 10 feet below the estimated average water table elevation and 5 feet above the estimated average water table elevation).

2.6 Northern Terminal Comprehensive Groundwater Sampling Event

Once the Northern Terminal monitoring wells have been installed and developed, they will be surveyed for horizontal coordinate and vertical (elevation) control. These newly installed 11 wells, along with the wells listed in Table 1, will be gauged with an interface probe and sampled in accordance with Section 2.2 above. It is estimated that the comprehensive northern terminal sampling event will take place approximately one quarter after the initial northern terminal sampling event.

Once a minimum of two and a maximum of four events of quarterly groundwater sampling have been completed, the data set will be evaluated. This evaluation will be used to generate a groundwater monitoring program for the Northern Terminal, as Northern Terminal groundwater monitoring was not contemplated in the October 2015 RAWP document. Following this initial set of up to four comprehensive groundwater data collection events and data evaluation, an updated and revised groundwater monitoring program will be proposed to NYSDEC for their review and consideration. This updated program will include a revised list of monitoring wells and analytical parameters for future proposed monitoring.

2.7 Northern Terminal Reporting

A report of findings summarizing the initial groundwater sampling event of the existing wells, the soil data collection, and the first comprehensive groundwater sampling event will be issued. This report will contain all relevant data noted above along with supporting attachments such as boring logs, well construction details, liquid level data, laboratory analytical reports. Additionally, data collected at the site in 2016 will be presented in this report of findings.

3 SOUTHERN TERMINALS INVESTIGATION ACTIVITIES

3.1 Southern Terminal Utility Mark Out

Prior to initiating subsurface disturbance activities, public utilities will be marked out by contacting Dig Safely New York to locate and mark all utilities near the areas of investigation. A private utility locator will also be contracted to provide additional utility mark out in the proposed areas of investigation. In accordance with Arcadis' subsurface clearance policy, unless variances are agreed to between various parties, each drilling location will also be hand cleared to a minimum of 5 feet below ground surface before drilling.

3.2 Southern Terminal Data Gap Area Assessment

This Work Plan proposes installing direct push soil penetrations across the Southern Terminals where data gaps exist. These borings will be conducted via LIF-type technology akin to the impact assessment work completed by AECOM in 2013 at the site. This data will allow for a three-dimensional understanding of the locations, and relative magnitude, of impacts across the data gap areas. The proposed locations of the LIF points are shown on Figure 5. Based on input and comments from NYSDEC, proposed LIF location #8 has been adjusted to line up with the former oil water separator structure that the NYSDEC removed from site during December 2017 – January 2018.

3.3 Soil Boring and Sampling Activities

Following collection and interpretation of the LIF data a brief summary memo will be prepared that would include a proposal for confirmation sampling. The LIF locations would be confirmed by approximately five (5) borings via traditional direct push or hollow stem auger advanced locations and collection of soil samples. This would allow for a calibration from the relative impact mapping provided by the LIF technology and actual compound-specific detections relative to Standards, Criteria, or Guidance values per NYSDEC Guidance Document CP-51. The final soil boring correlation sampling frequency determination will be made based on the results of the LIF data in conjunction with input from the NYSDEC.

Soil samples will be collected, at a minimum, from the interval with the highest PID reading above the water table and at the water table. Additionally, depending on field conditions and observations, samples may also be collected from additional intervals at each boring. All collected samples will be analyzed by PACE for constituents listed in NYSDEC Policy CP-51: Tables 2 and 3 (Soil Cleanup Levels for Gasoline and Fuel Oil Contaminated Soils, respectively) (NYSDEC, 2010b). Samples will also be analyzed for oxygenates and ethanol. Additionally, samples from the ground surface to 2 feet below ground surface will be analyzed for total lead.

In addition to the confirmatory boring set proposed here, four additional soil borings will be executed at the request of the NYSDEC as follows (Figure 5):

A boring will be added east of the small building located on the South East terminal (Figure 5) to characterize the impacts observed by the NYSDEC in this area during their removal of a 500-gallon consumptive use underground heating oil tank. The removal of the tank was conducted in

January 2018. Data collected from this boring will be analyzed via the same methods as all confirmatory borings being proposed.

Three shallow soil borings will be installed in the pipeline right of way located between the eastern and western southern terminals to collect shallow TCLP lead soil data quality. The most northerly of these samples will have two samples collected as follows: 0-2 feet below ground surface (fbgs) and 2-4 fbgs. The remaining two locations will have only the 0-2 fbgs sample collected.

A NYS licensed surveyor will be used to locate the LIF points as well as the soil borings installed on the southern terminal.

The results of the follow up, confirmation soil sampling plan may also suggest the installation of additional groundwater monitoring wells. Furthermore, the extended characterization of these areas should also support reevaluating the existing system design and layout especially with respect to the recent and substantial changes to the site access caused by the removal of the historic terminal above-ground infrastructure.

3.4 Southern Terminal Monitoring Well Network

Of the historic wells previously installed across the Cold Springs Terminals Site, 29 were listed in the October 2015 RAWP as wells required for system performance monitoring by the Southern Terminals Group (STG). This group of wells is listed on Table 2 and shown on Figure 4. 22 of these wells were located on the Southern Terminal properties and, as a result of recent demolition activities, have likely been compromised or lost. The remaining 7 wells are also of unknown condition. As such, baseline sampling and subsequent groundwater monitoring, as outlined in the October 2015 RAWP, will be conducted once the STG has re-established the system performance well monitoring network.

3.5 Southern Terminal Reporting

All the results of the activities described in this Work Plan will be presented in two reports as follows:

The first deliverable will be a memo summary of the LIF findings and will include a proposal for the confirmatory sampling program.

The second and final report will summarize LIF soil confirmation sampling activities. The report is anticipated to include, at a minimum, the following:

- A brief narrative describing the field activities, observations, and results
- An updated Site Plan showing the actual locations of all new surveyed soil borings
- Soil boring logs
- Copies of laboratory testing reports

4 REFERENCES

Cold Springs Terminal Mutual Defense Group. 2015. Remedial Action Work Plan. October 1, 2015.

New York State Department of Environmental Conservation (NYSDEC). 2010a. Department of Environmental Remediation-10 (DER-10), Technical Guidance for Site Investigation and Remediation. May 2010.

NYSDEC. 2010b. Guidance Document CP-51. October 21, 2010.

TABLES

Table 1
Northern Terminal Area Monitoring Wells

Cold Springs Terminals
Hillside Road
Lysander, New York

Well ID	Diameter (inches)	DTB (ft bgs)	TOS (ft bgs)
BMW1	2	15.0	5.3
BMW2	2	34.8	15.3
BMW3	2	29.7	3.5
BMW5	2	30.0	10.0
BMW6	2	30.0	10.0
BMW7	2	15.0	5.0
BMW8	2	20.0	5.0
BMW9	2	15.0	5.0
BMW13	2	UK	UK
BWM14	2	UK	UK
PZ106S	2	15.5	5.5

Notes:
DTB = depth to bottom
ft bgs = feet below ground surface TOS = top of screen
UK = Unknown

Table 2
Sitewide Remedial Performance Monitoring Wells

Cold Springs Terminals
Hillside Road
Lysander, New York

Well ID*	Diameter (inches)	DTB (ft bgs)	TOS (ft bgs)
A1	2	12	7
A4	2	23	8
A6	2	12	7
A10	2	14	4
A13	4	19	4
A16	4	19	4
A20	4	15	5
A21	2	14	4
A23	2	12	7
A25	2	14	4
B4	4	24.5	9.5
B9	2	22	12
B15	2	17	7
BMW3	2	29.7	3.5
BMW4	2	12.5	2.75
BMW9	2	15	5
HD4A	2	12	2
S2	4	20	5
S4	4	20	5
S5	4	15.5	5.5
S10	4	19	4
S12	2	18	3
S13	4	20	5
S15	4	19	4
S21	2	18.5	3.5
S22	2	8	3
S23	2	8	3
S24	2	8	3
SMW3	2	15	5

Notes:
DTB = depth to bottom
ft bgs = feet below ground surface TOS = top of screen
*These monitoring wells are part of the monitoring program, per the October 2015 RAWP.

FIGURES

LEGEND:

- MONITORING WELL
- PIEZOMETER
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

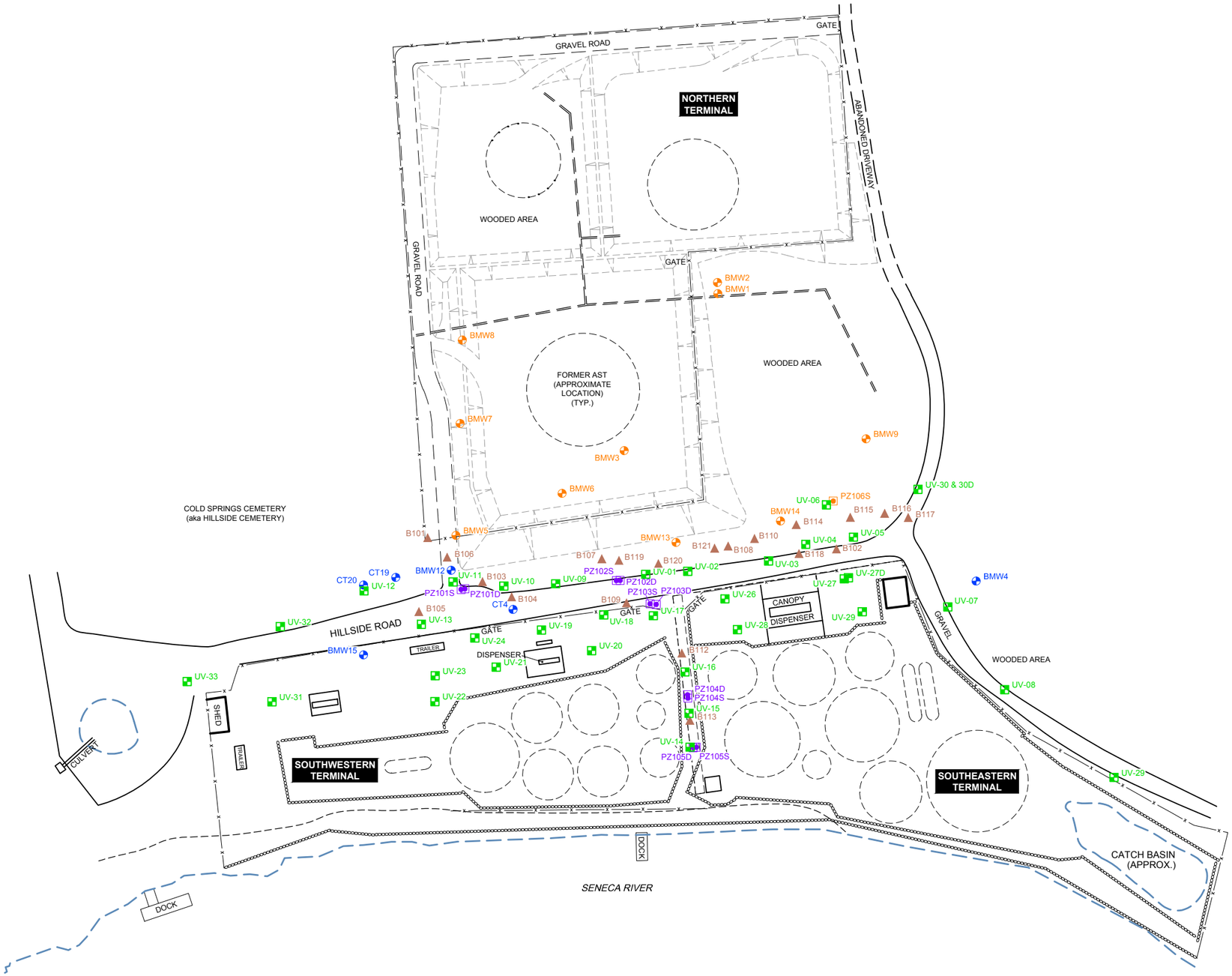
SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

SITE LAYOUT AND HISTORICALLY EXISTING MONITORING WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\roberlander\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Comany\2018\B0090004.0005\01-DWG\WP-Fig1-Site Layout.dwg LAYOUT: 1 SAVED: 1/3/2018 11:02 AM ACADVER: 20.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/4/2018 1:34 PM BY: OBERLANDER, ROSEANNE
XREFS: IMAGES: PROJECTNAME: ----
X-WP-Title Block
X-Base Map



LEGEND:

- MONITORING WELL
- NORTHERN TERMINAL EXISTING MONITORING LOCATIONS
- PIEZOMETER
- UVOST/CPT
- SOIL BORING
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

NORTHERN TERMINAL EXISTING MONITORING WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(On)ON=*;OFF=*REF*
C:\Users\roberlander\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2018\B09000004.0005\01-DWG\WP-Fig2-Est N MW.dwg LAYOUT: 2 SAVED: 1/3/2018 11:04 AM ACADVER: 20.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/4/2018 1:33 PM BY: OBERLANDER, ROSEANNE
XREFS: IMAGES: PROJECTNAME: ----
X-WP-Title Block
X-Base Map

LEGEND:

- PROPOSED MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- UVOST/CPT
- SOIL BORING
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

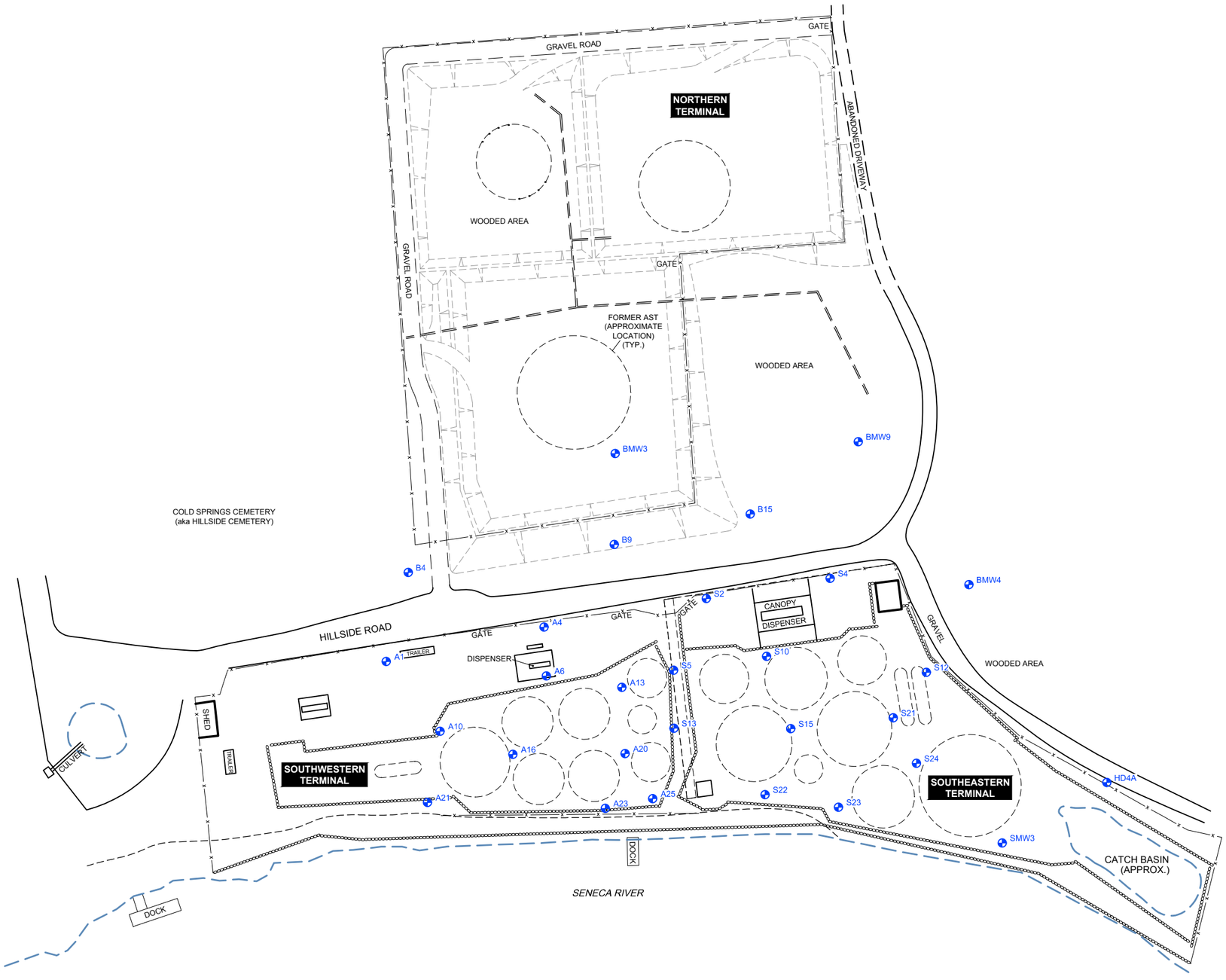
SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

PROPOSED NORTHERN AREA ADDITIONAL WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY: SYRACUSE NY DIV/GROUP: ENV/CAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(On)ON=*;OFF=*REF*
C:\Users\roberlander\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Comany\2018\B09000004.000501-DWG\WP-Fig3-Prop N MW.dwg LAYOUT: 3 SAVED: 1/3/2018 11:05 AM ACADVER: 20.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/4/2018 1:33 PM BY: OBERLANDER, ROSEANNE
XREFS: IMAGES: PROJECTNAME: ----
X-WP-Title Block
X-Base Map



LEGEND:

- REMEDIATION MONITORING WELL
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTE:

1. BASE MAP REFERENCE: "SITE MAP SYSTEM PERFORMANCE WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

REMEDIAL PERFORMANCE MONITORING WELLS (PER OCTOBER 2015 RAWP)

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

LEGEND:

- PROPOSED MONITORING WELL
- PROPOSED LASER INDUCED FLUORESCENT (LIF) LOCATION
- MONITORING WELL
- PIEZOMETER
- UVOST/CPT
- SOIL BORING
- PROPOSED SOIL BORING
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK
SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

PROPOSED MONITORING WELL, SOIL BORING, AND LIF LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

CITY: SYRACUSE NY DIV/GROUP: ENV/CAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\bdeclerc.1\OneDrive - ARCADIS\BIM 360 Docs\BP\Buckeye Pipeline Company\2018\B0090004.0005\01-DWG\WP-Fig5-Prop NW SB & LIF.dwg LAYOUT: 5 SAVED: 2/8/2018 9:12 AM ACADVER: 20.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/8/2018 9:12 AM
BY: DECLERC... BRIAN
XREFS: IMAGES: PROJECTNAME: ----
X-WP-Title Block
X-Base Map

ATTACHMENT 1

Monitoring Well Integrity Assessment Form

ARCADIS

Monitoring Well Integrity Assessment Form

(For each item, check appropriate response or fill in the blank)

Date _____

Well ID _____ ID Clearly Marked? _____ Project Name _____

Photo filename _____ Project Number _____

Weather _____ Field Personnel _____

General Description of Surroundings _____

Well Condition:

Damaged? ☐ Abandoned? ☐
(Describe Below)

Stick Up ☐ Flush Mount ☐

Lockable cover? _____

Lock present? _____

Key number: _____

Stick up height _____

Casing material _____

Well diameter _____

Protective casing material: _____

Protective casing diameter: _____

Cap present? Type? _____

Vented? If so, how? _____

Measuring point clearly marked? _____

Total depth reported: _____

Total depth measured: _____

DTW: _____

Well obstructed? If so, depth? _____

Well bottom soft (sediment) or firm? _____

Flush Mount Wells Only

Gasket present? _____

Bolts present? _____

Teflon washers present?

Surface Condition:

Damaged? ☐
(Describe Below)

Pad/cement intact? _____

Curb box/well cover present? _____

Intact? _____

Seal condition _____

All bolts present? _____

Ground surface slopes away from well? _____

Location Sketch

Comments/Recommendations:

NYSDEC Approval of 2018 Work Plan

From: Brazell, Richard J (DEC) <richard.brazell@dec.ny.gov>
Sent: Friday, February 23, 2018 9:43 AM
To: Hensel, Rebecca <Rebecca.Hensel@arcadis.com>
Cc: Maresco, Vin <Vin.Maresco@arcadis.com>; Conlon, Benjamin (DEC) <benjamin.conlon@dec.ny.gov>; Greg Boltus <gboltus@action-technical.com>
Subject: RE: Report Submission on Behalf of Vin Maresco

Rebecca and Vin

I approve the Supplemental Characterization Interim Remedial Action Work Plan for the Cold Springs Terminal.

Currently the DEC, as part of the removal of the oil water separator on the southern terminal, continues to remove free product from the site. Two riser pipes have been installed that Action Technical is utilizing to remove the free product. I anticipate this activity to continue until there is no free product present or the Southern Terminal submits a revised work plan and commences work.

If you have any questions do not hesitate to contact me.

Richard J. Brazell P.E.
Regional Spill Engineer, NYS DEC Spill Response

New York State Department of Environmental Conservation
615 Erie Boulevard West, Syracuse, NY 13204-2400
P: 315-426-7523 | M: 315-447-8516 | richard.brazell@dec.ny.gov
www.dec.ny.gov |

From: Hensel, Rebecca [mailto:Rebecca.Hensel@arcadis.com]
Sent: Thursday, February 22, 2018 10:49 PM
To: Brazell, Richard J (DEC) <richard.brazell@dec.ny.gov>
Cc: Maresco, Vin <Vin.Maresco@arcadis.com>
Subject: Report Submission on Behalf of Vin Maresco

Good Evening Richard,

On behalf of Vin Maresco, attached is the Supplemental Characterization Interim Remedial Action Work Plan for the Cold Springs Terminals. Additionally, a hard copy of the report is scheduled to arrive at your office Monday. Vin is on vacation and will be returning Monday morning, until then please feel free to reach out to me with any questions.

Thank you,
Rebecca

Rebecca Hensel, EIT | Environmental Engineer | rebecca.hensel@arcadis.com
Arcadis | U.S., Inc.
110 West Fayette Street Suite 300, Syracuse, NY | 13202 | USA
T. +1 315.671.9296 C. +1 315.751.3069

APPENDIX 2

Boring Logs from 2016

Date Start/Finish: 4/5/16-4/25/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141246.01
Easting: 908795.81
Casing Elevation: NA

Borehole Depth: 27.0' bgs
Surface Elevation: 386.79' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B101**

Client: Cold Springs Northern Terminal

Location: Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 385	1	0-5	NA	0.0		Medium brown SANDY SILT, trace Clayey Silt, grass, roots, topsoil, medium brown, wet. Light brown to medium brown/red medium-fine SAND, trace Silt, moist, no odor.	
5 / 380	2	5-8	1.8	0.0 1.6		Light grey/brown fine SAND to Silty Sand. trace Silt, dry to moist.	
10 / 375	3	8-12	3.2	1.4		Light grey/brown fine SAND to Silty Sand, trace Silt.	Borehole backfilled with pelletized bentonite and native material.
15	4	12-16	3.4	0.9		Moist to wet at 14.5' bgs.	

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northern Terminal

Well/Boring ID: **B101**

Borehole Depth: 27.0' bgs

Site Location:
Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
370	5	16-20	4.0	1069		Light grey/brown fine SAND to Silty Sand, trace Silt.	
20				1651		Wet, sheen, odors, firm.	
365	6	20-24	4.0	535.1		Light to dark grey fine to medium SAND, wet, running sands, odors, sheen.	Borehole backfilled with pelletized bentonite and native material.
	7	24-27	2.0			Light to dark grey fine to medium SAND, wet, running sands, odors, sheen.	
25				15.4		Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
360						Boring terminated at 27' bgs.	
30							
355							
35							

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Date Start/Finish: 4/6/16-4/20/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141236.02
Easting: 909155.78
Casing Elevation: NA

Borehole Depth: 19.0' bgs
Surface Elevation: 373.94' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B102**

Client: Cold Springs Northern Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	375							
0							Asphalt.	
							Light grey SILTY SAND to fine SAND, trace coarse Sand, fine angular Gravel, dry, odors, firm/dense.	
					58.7			
		1	0-4	NA	169.6		Medium to dark brown SILTY SAND, trace angular fine Gravel, roots, odor, moist.	
					>15000		Dark brown/grey CLAYEY SILT, trace fine Sand, odor, staining, clump, moist, firm, slightly plastic.	
	370							
5							Light grey fine SAND, trace Silt, odor, some dark staining, firm, dry to moist.	
		2	4-8	2.4	1781			
	365						No staining below 9.0' bgs.	Borehole backfilled with pelletized bentonite and native material.
10		3	8-12	1.6	1532			
	360	4	12-16	NR	NA			
15								

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northern Terminal

Well/Boring ID: **B102**

Site Location:
Lysander, NY

Borehole Depth: 19.0' bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
355	5	16-19	3.0	358.7		Light grey fine SAND, trace Silt, odor, some dark staining, firm, dry to moist. Till encountered at 19.0' bgs	Borehole backfilled with pelletized bentonite and native material.
20 / 350						Boring terminated at 19' bgs.	
25 / 345							
30 / 340							
35							

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Date Start/Finish: 4/5/16-4/25/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141207.22
Easting: 908844.08
Casing Elevation: NA

Borehole Depth: 23.9' bgs
Surface Elevation: 379.79' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B103**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	375							
0							Asphalt.	
							Light brown medium red/brown medium to fine SAND, trace Silt, no odor, moist to wet, loose to moderately firm.	
		1	0-4	NA	0.0			
					0.0		Light brown medium red/brown medium to fine SAND, little Silt, 15-20% Clayey Silt, no odor, moist to wet, firm, slightly plastic.	
	370							
5					18.7		Light brown SILTY SAND, moist, loose to moderately firm.	
		2	4-8	2.6	453.4		Light grey/brown fine SAND, trace Silt, dry to moist, odors.	
	365				583.8			Borehole backfilled with pelletized bentonite and native material.
10		3	8-12	2.1	1702		Reddish hue to soil 9.5-10.1' bgs.	
					1693			
							Light brown fine SAND, wet, running, sheen, odor.	
	360	4	12-16	2.8	1107			
15								

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B103**

Borehole Depth: 23.9' bgs

Site Location:
Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	5	16-20	4.0	1380		Light brown fine SAND, wet, running, sheen, odor.	
355							
20				180.1		Dark grey to black staining 20-21.5' bgs.	Borehole backfilled with pelletized bentonite and native material.
	6	20-24	4.0			Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
				159.1			
350						Refusal at 23.9'	
25							
345							
30							
340							
35							

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Date Start/Finish: 4/5/16-4/25/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141193.88
Easting: 908869.76
Casing Elevation: NA

Borehole Depth: 23.0' bgs
Surface Elevation: 379.38' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B104**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
380 / 0							
				0.0		Asphalt.	
				0.0		Dark brown to grey SILTY SAND and subangular fine GRAVEL, dry, compact.	
	1	0-4	NA	0.1		Medium red/brown SILTY SAND, compact, moist to wet.	
				0.5		Light grey CLAYEY SILT, slightly plastic, firm, moist to wet.	
375 / 5	2	4-8	4.0	63.5		Light brown to grey SILTY SAND, firm, moist.	
				67.8		Odor at 8.0' bgs.	Borehole backfilled with pelletized bentonite and native material.
				293.1			
370 / 10	3	8-12	2.3	2117		Light brown to grey SILTY SAND, firm, moist.	
				2110			
	4	12-16	1.7	2007		Light to medium brown fine SAND, trace Silt, wet, odor, loose, sheen, running sand.	
365 / 15							

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Client: Cold Springs Northen Terminal

Well/Boring ID: **B104**

Site Location:
Lysander, NY

Borehole Depth: 23.0' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		5	16-20	4.0	2220 537.1		Light to medium brown fine SAND, trace Silt, wet, odor, loose, sheen, running sand.	
20	360	6	20-24	3.0	186.7 294 7.1		Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	Borehole backfilled with pelletized bentonite and native material.
25	355						Refusal at 23.0' bgs.	
30	350							
35	345							

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 4/6/16-4/25/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141180.91
Easting: 908788.05
Casing Elevation: NA

Borehole Depth: 23.0' bgs
Surface Elevation: 378.91' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B105**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	380							
0					0.0		Asphalt.	
					38.4		Light grey-brown SILTY SAND, trace fine angular Gravel, dry, frozen, dense, no odor.	
		1	0-4	NA	0.2		Light to medium brown fine SAND, trace Silt, trace subangular fine Gravel, dry to moist.	
							Light to medium red/brown SILTY SAND, firm, moist.	
	375				3.0		Light grey CLAYEY SILT, trace fine Sand, firm, dense, moist.	
5		2	4-8	2.9	0.1		Light to medium brown SILTY SAND, moist to wet, firm.	
					11.5			Borehole backfilled with pelletized bentonite and native material.
	370							
10		3	8-12	2.7	268.8		Light-dark grey fine SAND, staining, dry-moist, odor.	
							No recovery.	
	365	4	12-16	0.0	NA			
15								

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Client: Cold Springs Northen Terminal

Well/Boring ID: **B105**

Site Location:
Lysander, NY

Borehole Depth: 23.0' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		5	16-20	4.0	186.1		Light to dark grey fine SAND, wet, running sands, staining below 18.0' bgs.	
	360				208.4			
20								Borehole backfilled with pelletized bentonite and native material.
		6	20-23	2.6	18.4			
					0.6		Rust orange fine rounded GRAVEL, little fine to medium Sand, loose, wet.	
							Rust orange fine rounded GRAVEL, little fine to medium Sand, wet, dense [TILL].	
	355							
25								
	350							
30								
	345							
35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Date Start/Finish: 4/6/16-4/25/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141228.82
Easting: 908812.97
Casing Elevation: NA

Borehole Depth: 24.0' bgs
Surface Elevation: 384.45' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B106**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
385 / 0				0.0		Grass, roots.	
				0.2		Light to medium red/brown SILTY SAND, trace fine gravel, moist.	
	1	0-4	NA				
				0.4		Light grey CLAYEY SILT, trace fine Sand, firm, moist.	
380 / 5				0.6		Light grey SILTY SAND, trace Clayey Silt, firm, dry.	
	2	4-8	2.9	0.6		Light grey SILTY SAND, firm, dry.	
375 / 10	3	8-12	2.7	0.7			Borehole backfilled with pelletized bentonite and native material.
370 / 15	4	12-16	0	0.8			

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B106**

Borehole Depth: 24.0' bgs

Site Location:
Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
				743.1		Light grey SILTY SAND, firm, dry.	
						White to light grey fine SAND, dry-moist, odor.	
	5	16-20	4.0	1601			
365							
20							Borehole backfilled with pelletized bentonite and native material.
	6	20-24	2.6	44.9		Macrocore split in barrel upon encountering till interface.	
360							
25						Refusal at 24.0' bgs (possible Till).	
355							
30							
350							
35							

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 4/8/16-4/22/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141227.38
Easting: 908949.15
Casing Elevation: NA

Borehole Depth: 24.0' bgs
Surface Elevation: 381.35' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B107**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	381				0.0		Grass, roots.	
							Medium brown fine SAND, trace Silt, trace fine angular Gravel, moist	
	380	1	0-4	NA	0.1			
					0.0		Light grey/brown CLAYEY SILT, trace Sandy Silt, firm, dry to moist.	
5		2	4-8	2.7	0.5		Light brown/tan fine SAND, trace Silt, firm, moist.	
	375							
					18.5			Borehole backfilled with pelletized bentonite and native material.
10		3	8-12	3.3	201.6		Light grey/brown fine SAND, trace Silt, moist, odor.	
	370							
					2093			
		4	12-16	2.7	1147			
15								

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B107**

Site Location:
Lysander, NY

Borehole Depth: 24.0' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	365						Light grey/brown fine SAND, trace Silt, moist, odor.	
		5	16-20	4.0	2008			
					697.7			
20								Borehole backfilled with pelletized bentonite and native material.
	360	6	20-24	4.0				
25							Refusal at 24.0' bgs (possible Till).	
	355							
30								
	350							
35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

Date Start/Finish: 4/8/16-4/20/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141238.56
Easting: 909060.36
Casing Elevation: NA

Borehole Depth: 24.0' bgs
Surface Elevation: 379.74' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B108**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	380	1	0-4	NA	0.0		Grass, roots.	Borehole backfilled with pelletized bentonite and native material.
					0.0		Medium brown fine SAND, trace Silt, trace fine angular Gravel, moist.	
					0.1		Light grey/brown CLAYEY SILT, trace fine Sand, firm, moist.	
5	375	2	4-8	3.5	0.0		Light grey fine SAND, 20% subangular fine Gravel, dry to moist.	
					0.8		Light medium brown/tan fine SAND, firm, dry to moist.	
							Light medium brown/tan fine SAND, firm, moist.	
10	370	3	8-12	2.6	3.5		Light medium brown/tan fine SAND, firm, moist, stained dark grey to black.	
					18.4		Light grey SILTY SAND, dry to moist, firm, odor.	
					1019			
15	365	4	12-16	3.3	1525		Light grey SILTY SAND, wet, firm, odor.	
					1321			

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B108**

Site Location:
Lysander, NY

Borehole Depth: 24.0' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		5	16-20	4.0	1808 211.5		Light grey SILTY SAND, wet, firm, odor (running sands).	
20	360	6	20-24	4.0	75 72.9 40.3		Light brown/red medium to fine SAND, 10-15% fine angular Gravel, wet, odor. Light brown/red medium to fine SAND, wet, odor, stained black. Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	Borehole backfilled with pelletized bentonite and native material.
25	355						Refusal at 24.0' bgs.	
30	350							
35	345							

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 4/8/16-4/22/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141188.58
Easting: 908970.87
Casing Elevation: NA

Borehole Depth: 27.1' bgs
Surface Elevation: 378.37' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B109**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
380							
0				0.0		Asphalt.	
				0.2		Medium brown SILTY SAND, some fine angular Gravel, firm, dry to moist.	
						Light brown fine SAND, trace Silt, firm, dry to moist.	
375	1	0-8	NA	0.1			
5				0.1		Light grey/brown CLAYEY SILT, trace fine Sand, slightly plastic, firm.	
				2.3		Light grey fine SAND, trace Clayey Silt, moist to wet.	
				2.3		Light grey fine SAND, trace Clayey Silt, moist to wet, some dark grey staining.	
370				1635		Light to medium grey SILTY SAND, firm, moist, odor.	Borehole backfilled with pelletized bentonite and native material.
10	2	8-12	3.0	1940		Light brown/ tan fine SAND, trace Silt, firm, moist to wet, odor.	
						Light brown/ tan fine SAND, trace Silt, firm, moist to wet, odor, sheen.	
365	3	12-16	3.8	1235			
15							

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B109**

Borehole Depth: 27.1' bgs

Site Location:
Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
360	4	16-20	4.0	240.2 178.3		Light brown/ tan fine SAND, trace Silt, firm, moist to wet, odor, sheen.	
20	5	20-24	2.8	57.5 119.2			Borehole backfilled with pelletized bentonite and native material.
355	6	24-27.1	3.1	37.3 37.3		Coarse SAND and fine angular GRAVEL, wet, odor, black staining. Coarse SAND and fine angular GRAVEL, little fine Sand, wet, odor, black staining. Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
25						Refusal at 27.1' bgs.	
350							
30							
345							
35							

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Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

Date Start/Finish: 4/21/16-4/25/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141245.18
Easting: 909083.59
Casing Elevation: NA

Borehole Depth: 27.0' bgs
Surface Elevation: 379.01' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B110**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	380							
0					0.0		Grass and roots.	
					0.0		Medium brown fine SAND, trace Silt, trace fine subangular Gravel, moist.	
	375	1	0-8	NA	0.1		Light grey CLAYEY SILT, trace fine Sand, firm, moist.	
5					0.9		Light grey fine SAND, trace Silt, trace subangular fine Gravel, firm, moist.	
	370	2	8-12	4.0	810.2		Light grey fine SAND, trace Silt, trace subangular fine Gravel, firm, moist, odor.	Borehole backfilled with pelletized bentonite and native material.
10					1787			
	365	3	12-16	2.9	1788		Light grey fine SAND, trace Silt, trace subangular fine Gravel, firm, wet, odor (running sand).	
15								

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B110**

Borehole Depth: 27.0' bgs

Site Location:
Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
				871.4		Light grey fine SAND, trace Silt, trace subangular fine Gravel, firm, wet, odor (running sand).	
360	4	16-20	4.0	1602		Macrocore split in barrel.	
20						Light grey fine SAND, trace Silt, trace subangular fine Gravel, firm, wet, odor, dark staining (running sand).	
	5	20-24	2.0	74.2			Borehole backfilled with pelletized bentonite and native material.
355							
25	6	24-27	2.4	181.7		Macrocore split in barrel. Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
						Refusal at 27.0' bgs.	
350							
30							
345							
35							

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

Date Start/Finish: 4/21/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141144.29
Easting: 909019.63
Casing Elevation: NA

Borehole Depth: 16.0' bgs
Surface Elevation: 375.44' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B112**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	375	1	0-8	NA	0.6		Medium brown fine SAND, trace Silt, trace organics (roots).	
					0.5		Medium brown fine SAND, trace Silt, some light to medium brown and light grey Clayey Silt, firm, moist to dry.	
5	370				53.1		Light to medium brown/grey SANDY SILT to Silty Clay, slightly plastic, firm, moist, odor.	
					163.3		Light to medium fine SAND, wet to moist odor.	Borehole backfilled with pelletized bentonite and native material.
10	365	2	8-12	3.7	604.1			
					826.4			
		3	12-16	3.0	773.9			
15	360				47.1		Tan/brown fine SAND, very wet, stiff (running sand).	
							Boring terminated at 16' bgs.	

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

Date Start/Finish: 4/21/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141085.25
Easting: 909026.70
Casing Elevation: NA

Borehole Depth: 19.5' bgs
Surface Elevation: 373.81' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B113**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
375 / 0				1.1		Light grey SILTY SAND, some fine angular Gravel, trace organics (roots), firm.	
				1.1		Light brown/tan fine SAND, trace Silt, trace fine angular Gravel,	
				957.8		Light grey SANDY SILT, trace Clayey Silt, firm, dry to moist, odor.	
370 / 5	1	0-8	NA				
				715.8		Light grey fine to medium SAND, wet, odor, grey staining.	
						Light grey fine to medium SAND, wet, odor, grey staining (running sand).	Borehole backfilled with pelletized bentonite and native material.
365 / 10	2	8-12	3.1	535.1			
				876.4			
				511.3			
360 / 15	3	12-16	3.0	107.8			

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B113**

Site Location:
Lysander, NY

Borehole Depth: 19.5' bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
355	4	16-19.5	3.5	37.1		Light grey fine to medium SAND, wet, odor, grey staining (running sand).	Borehole backfilled with pelletized bentonite and native material.
20 / 350 / 25 / 345 / 30 / 340 / 35						Refusal at 19.5' bgs (possible Till).	

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 4/5/16-4/20/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141257.50
Easting: 909120.38
Casing Elevation: NA

Borehole Depth: 19.6' bgs
Surface Elevation: 374.86' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B114**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	375							
					0.0		ASPHALT.	
					0.0		Medium brown/grey SILTY SAND, firm, dry to moist.	
		1	0-4	NA	0.0		Light brown/red fine to medium SAND, moist to wet.	
					0.0			
5	370				2.3		Light brown/tan fine SAND, trace Silt, slight odor.	
		2	4-8	2.9				
					337.5		Light brown/tan fine SAND, trace Silt, slight odor, dark staining.	
					822.4		Light brown/tan fine SAND, trace Silt, slight odor, moist to wet, dark staining.	Borehole backfilled with pelletized bentonite and native material.
10	365	3	8-12	2.5	893.4			
		4	12-16	0.0	NA		No recovery, product on tooling.	
15	360							

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B114**

Borehole Depth: 19.6' bgs

Site Location:
Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		5	16-19.6	3.6	108.7		Light brown/tan fine SAND, trace Silt, slight odor, moist to wet, dark staining.	Borehole backfilled with pelletized bentonite and native material.
					363.5		Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
20	355						Refusal at 19.6' bgs.	
25	350							
30	345							
35	340							

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 4/5/16-4/20/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141263.95
Easting: 909168.02
Casing Elevation: NA

Borehole Depth: 15.0' bgs
Surface Elevation: 373.98' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B115B**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	375							
0					0.0		ASPHALT.	
					0.2		Light to medium SILTY SAND and fine angular GRAVEL, dry to moist.	
		1	0-4	NA	35.0		Medium brown/ grey SILTY SAND, firm to loose, dry to moist, odor, staining.	
	370							
					5.1		Medium to dark grey SILTY SAND, firm, moist.	
5					0.7		Light brown/tan fine SAND, trace Silt, dense, moist to dry.	
		2	4-8	3.0	0.0		Light brown/tan fine SAND, trace Silt, dense, moist to dry, grey staining.	Borehole backfilled with pelletized bentonite and native material.
	365							
10		3	8-12	2.5	8.1		Light brown/tan fine SAND, trace Silt, dense, wet, grey staining.	
					0.7		Light brown/tan fine SAND, trace Silt, dense, wet, grey staining (running sand).	
	360	4	12-16	3.0				
15					0.0		Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
							Refusal at 15.0' bgs.	

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

Date Start/Finish: 4/5/16-4/20/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141267.35
Easting: 909198.23
Casing Elevation: NA

Borehole Depth: 11.6' bgs
Surface Elevation: 373.89' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B116**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	375							
0					0.0		Light brown SILTY SAND and fine angular GRAVEL, trace Silt, dry to moist.	
							Light to medium SILTY SAND, trace Clayey Silt, slightly plastic, some staining.	
		1	0-4	NA	1.2			
							Light to medium SILTY SAND, little Clayey Silt, slightly plastic, wet, some staining.	
	370				5.6			
5		2	4-8	2.6	7.1			Borehole backfilled with pelletized bentonite and native material.
	365							
10		3	8-11.6	3.6	0.7			
					1.1		Grey fine SAND some fine angular Gravel, firm, moist to wet.	
							Refusal at 11.6' bgs (possible Till).	
	360							
15								

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

Date Start/Finish: 4/5/16-4/20/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141263.78
Easting: 909219.02
Casing Elevation: NA

Borehole Depth: 15.2' bgs
Surface Elevation: 374.58' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B117**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	375							
0					0.0		Medium brown fine to medium GRAVEL, some Sandy Silt, trace subangular to subrounded Cobbles, dry to moist.	
					0.0		Light brown/red SILTY SAND, trace fine to medium Gravel, dry to moist.	
		1	0-4	NA	0.0		Light brown/red SILTY SAND, trace Clay, trace fine to medium Gravel, slightly plastic, dry to moist.	
	370						Light to medium brown SILTY SAND, trace fine to medium Sand interbedded, firm, moist.	
5		2	4-8	2.7	0.0			
					0.0			
	365						Light grey to medium brown SILTY SAND, trace fine to medium Sand interbedded, firm, wet, (running sand).	Borehole backfilled with pelletized bentonite and native material.
10		3	8-12	3.3	0.0			
					0.1			
		4	12-15.2	3.2	0.1		Coarse SAND and fine angular GRAVEL, trace Silt, wet, dark staining.	
	360				0.1		Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
15							Refusal at 15.2' bgs.	

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 4/5/16-4/20/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push
Sampling Method: 4' x 2" Acetate Liner
Rig Type: Geoprobe 7822

Northing: 1141231.97
Easting: 909122.81
Casing Elevation: NA

Borehole Depth: 20.0' bgs
Surface Elevation: 374.18' AMSL

Descriptions By: Ethan Ulm

Well/Boring ID: **B118**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	375							
0					0.0		ASPHALT.	
					181.7		Light brown SILTY SAND, little fine to medium Gravel, dry to moist, grey staining, odor..	
		1	0-4	NA	27.1		Brown to grey SILTY SAND, trace Clayey Silt, firm, moist, odor.	
	370							
5		2	4-8	3.4	1560		Brown to grey SILTY SAND, trace Clayey Silt, firm, moist, odor.	
					1749			Borehole backfilled with pelletized bentonite and native material.
	365						Brown to grey SILTY SAND, trace Clayey Silt, firm, wet, odor.	
10		3	8-12	1.5	1688			
					73.9		Light brown/tan fine SAND, firm, wet, odor (running sand).	
	360	4	12-16	4.0	102.1			
15								

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northen Terminal

Well/Boring ID: **B118**

Site Location:
Lysander, NY

Borehole Depth: 20.0' bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
355	5	16-20	4.0	37.3		Light brown/tan fine SAND, firm, wet, odor (running sand).	Borehole backfilled with pelletized bentonite and native material.
20						Refusal at 20.0' bgs (possible Till).	
350							
25							
345							
30							
340							
35							

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available.

Date Start/Finish: 4/4/16 - 4/18/16
Drilling Company: Parratt-Wolff
Driller's Name: Mark Eaves
Drilling Method: Direct Push / HSA
Auger Size: 4.25" ID
Rig Type: Truck-Mounted Geoprobe Rig
Sampling Method: 4' x 2" Acetate Liner

Northing: 1141202.22
Easting: 908828.54
Casing Elevation: D 379.37' AMSL
Addit. Casing Elevation: S 379.32' AMSL
Borehole Depth: 23.3' bgs
Surface Elevation: 379.63' AMSL

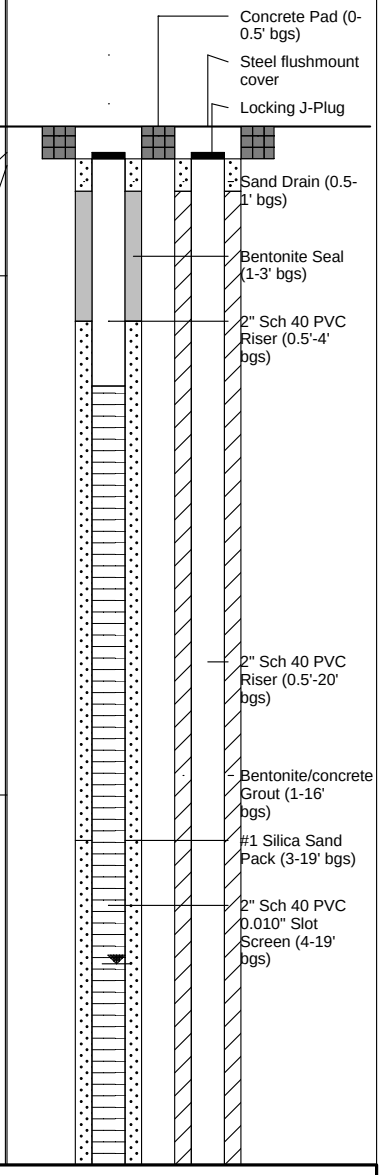
Descriptions By: Ethan Ulm

Well/Boring ID: **PZ101D / PZ101S**

Client: Cold Springs Northen Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	380						0.0		Asphalt surface.
							0.0		Grey fine to medium angular GRAVEL, little Silty Sand, dry-moist (road base).
							0.1		Light brown CLAYEY SILT with thin laminations of Silty Sand, firm, moist.
		1	0-4	NA	NA	NA			
									Light brown CLAYEY SILT with thin laminations of Silty Sand increasing clay, firm, slightly plastic, moist.
							0.0		
5	375	2	4-8	2.5	NA	NA	1058		
							1915		
10	370	3	8-12	3.2	NA	NA			Light brown/grey fine SAND and SILT, red staining, odors.
							2105		
							2780		
15	365	4	12-16	3.1	NA	NA	780.3		Running sands begin from 13.1-15.1'bgs



ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow-stem augers.

PZ101S was drilled and installed based on information collected at PZ101D

Client: Cold Springs Northen Terminal

Well/Boring ID: **PZ101D / PZ101S**

Site Location:
Lysander, NY

Borehole Depth: 23.3' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		5	16-20	2.0	NA	NA	1805		Light brown/grey fine SAND and SILT, red staining, odors.	#1 Silica Sand Pack (3-19' bgs)
20	360									Bentonite Seal (16-18' bgs)
										2" Sch 40 PVC 0.010" Slot Screen (4-19' bgs)
										2" Sch 40 PVC Riser (0.5'-20' bgs)
							20.9			#1 Silica Sand Pack (18-22' bgs)
		6	20-23.3	3.3	NA	NA			Dark grey to black fine-medium SAND and coarse SAND to fine subangular Gravel, compact, stiff, wet.	
							2.1			2" Sch 40 PVC 0.010" Slot Screen (20-22' bgs)
							0.4		Red/brown CLAYEY SILT, trace fine Sand, stiff, dry.	
25	355								Boring terminated at 23.3' bgs.	
30	350									
35	345									

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow-stem augers.

PZ101S was drilled and installed based on information collected at PZ101D

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 4/4/16 - 4/14/16
Drilling Company: Parratt Wolff
Driller's Name: Mike Evans
Drilling Method: Hollow Stem Auger
Auger Size: 4.25" ID
Rig Type: CME-55
Sampling Method: 2" x 2' Split Spoon

Northing: 1141209.64
Easting: 908965.29
Casing Elevation: D 377.96' AMSL
Addit. Casing Elevation: S 378.06' AMSL
Borehole Depth: 24.9' bgs
Surface Elevation: 378.52' AMSL

Descriptions By: Ethan Ulm

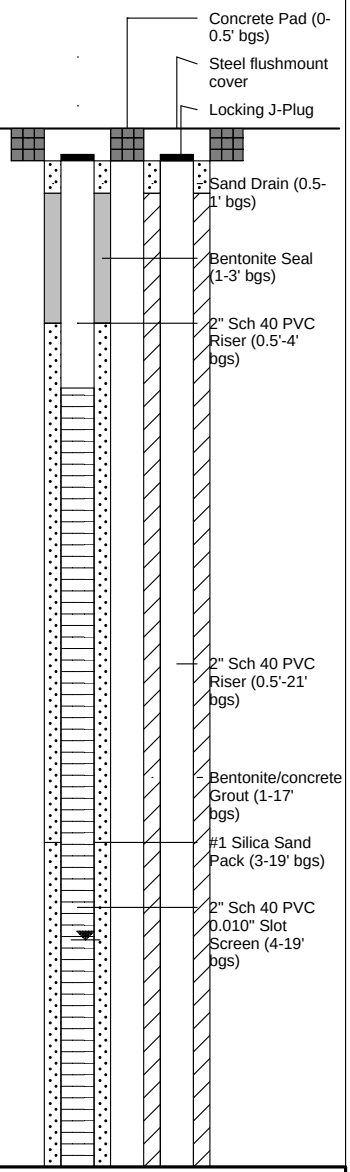
Well/Boring ID: **PZ102D / PZ102S**

Client: Cold Springs Northern Terminal

Location: Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
380								
0						0.0		ASPHALT.
								Fine to medium angular GRAVEL, light grey Silty Sand, wet-moist (road base)
								Light brown CLAYEY SILT with interbedded Silty Sand, increase moisture with depth, increase density.
	NA	NA	NA	NA	NA	0.0		
375						0.0		
						0.0		Gravel content increasing to some below 4.7' bgs.
5	1	5-6	0.3	4 3	7	17		
	2	6-8	2.0	3 3 3 4	6	210.2		Light brown CLAYEY SILT with interbedded Silty Sand, dry, increase density, odor.
370	3	8-10	1.5	2 2 2 3	4	716.9		Light to medium brown SILTY SAND, trace Silt lenses, loose to firm, moist.
10	4	10-12	1.6	3 3 2 4	5	1847		Light to medium brown SILTY SAND, trace Silt lenses, loose to firm, moist to wet at 12.5' bgs (running sand).
	5	12-14	1.5	2 4 4 4	8	2095		
365								Color change to brown below 14' bgs.
15	6	14-16	1.7	4 5 4 5	9	1209		

Well/Boring Construction



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Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow-stem augers.

PZ102S was drilled and installed based on information collected at PZ102D

Client: Cold Springs Northern Terminal

Well/Boring ID: PZ102D / PZ102S

Site Location:
Lysander, NY

Borehole Depth: 24.9' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		7	16-18	1.6	6 7 7 8	14	778.1		Light to medium brown SILTY SAND, trace Silt lenses, loose to firm, moist to wet at 12.5' bgs (running sand).	#1 Silica Sand Pack (3-19' bgs) Bentonite/concrete Grout (1-17' bgs) Bentonite Seal (17-19' bgs) 2" Sch 40 PVC 0.010" Slot Screen (4-19' bgs) 2" Sch 40 PVC Riser (0.5'-21' bgs) #1 Silica Sand Pack (19-23' bgs) 2" Sch 40 PVC 0.010" Slot Screen (21-23' bgs)
	360	8	18-20	1.5	2 2 4 6	6	112.5			
20		9	20-22	1.3	2 1 21 11	22	136.5 136.5		Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt.	
	355	10	22-24	1.9	7 7 9 17	16	345.2 345.2			
		11	24-24.9	0.9	50/0.9	NA	20.7		Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
25									Boring refusal at 24.9' bgs.	
	350									
30										
	345									
35										

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow-stem augers.

PZ102S was drilled and installed based on information collected at PZ102D

ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 4/8/16 - 4/13/16
Drilling Company: Parratt Wolff
Driller's Name: Mike Evans
Drilling Method: Hollow Stem Auger
Auger Size: 4.25" ID
Rig Type: CME-55
Sampling Method: 2" x 2' Split Spoon

Northing: 1141188.45
Easting: 908997.05
Casing Elevation: D 377.65' AMSL
Addit. Casing Elevation: S 377.66' AMSL
Borehole Depth: 26.0' bgs
Surface Elevation: 378.05' AMSL

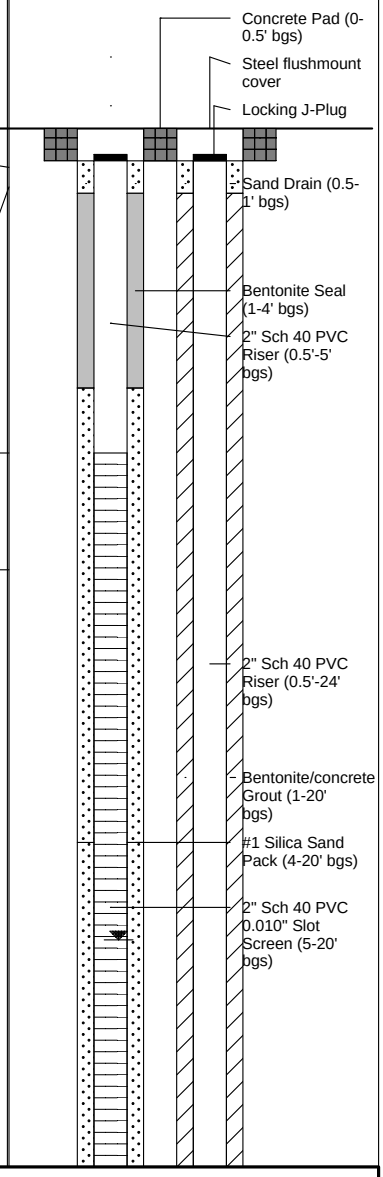
Descriptions By: Ethan Ulm

Well/Boring ID: **PZ103D / PZ103S**

Client: Cold Springs Northern Terminal

Location: Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
380								
0						0.0		Asphalt
						0.0		Light brown SANDY SILT, some fine to medium angular Gravel, firm, dry-moist, dense
						0.0		Light brown fine SAND, trace clayey silts, roots, firm.
	NA	0-5	NA	NA	NA			
375						0.0		
5	1	5-6	0.6	2 3	NA	0.2 0.2		Light to medium brown SILTY SAND, trace clayey silts, firm, slightly plastic, moist, no odors. More clayey silts, dark staining, odors.
	2	6-8	1.7	2 3 3 3	6	169.3 277.1		Medium brown/grey fine SAND, moist to wet, odors.
370	3	8-10	0.8	1 2 2 4	4	162.5		
10	4	10-12	1.5	3 3 3 3	6	1596		
	5	12-14	1.3	2 3 3 3	6	1116		
365								
15	6	14-16	1.0	wt wt wt 3	NA	549.1		



Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow-stem augers.

PZ103S was drilled and installed based on information collected at PZ103D

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northern Terminal

Well/Boring ID: **PZ103D / PZ103S**

Borehole Depth: 26.0' bgs

Site Location:
Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
					5 5 7 7		571.8		Medium brown/grey fine SAND, moist to wet, odors.	#1 Silica Sand Pack (4-20' bgs)
		7	16-18	2.0		12	7.1		no staining, odors	
	360				wt wt 5 6					Bentonite/concrete Grout (1-20' bgs)
		8	18-20	1.4		NA	42.7			2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
20					5 5 9 7				medium to dark staining, wet, odors	2" Sch 40 PVC Riser (0.5'-24' bgs)
		9	20-22	1.9		14	51.4			Bentonite Seal (20-22' bgs)
					8 8 19 14		29.2			#1 Silica Sand Pack (22-26' bgs)
	355	10	22-24	1.5		27	5.7		Dark grey to black medium to fine SAND and fine angular to subangular GRAVEL, trace Silt, firm, dense, compact. [TILL]	
25					25 31 34 40					2" Sch 40 PVC 0.010" Slot Screen (24-26' bgs)
		11	24-26	1.8		64	NA			
									Boring terminated at 26' bgs.	
	350									
30										
	345									
35										

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Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow-stem augers.

PZ103S was drilled and installed based on information collected at PZ103D

Date Start/Finish: 4/7/16-4/11/16
Drilling Company: Parratt Wolff
Driller's Name: Mike Evans
Drilling Method: Hollow Stem Auger
Auger Size: 4.25" ID
Rig Type: CME-55
Sampling Method: JRO

Northing: 1141108.91
Easting: 909024.65
Casing Elevation: D 373.98' AMSL
Addit. Casing Elevation: S 373.88' AMSL
Borehole Depth: 26.7' bgs
Surface Elevation: 374.24' AMSL

Descriptions By: Ethan Ulm

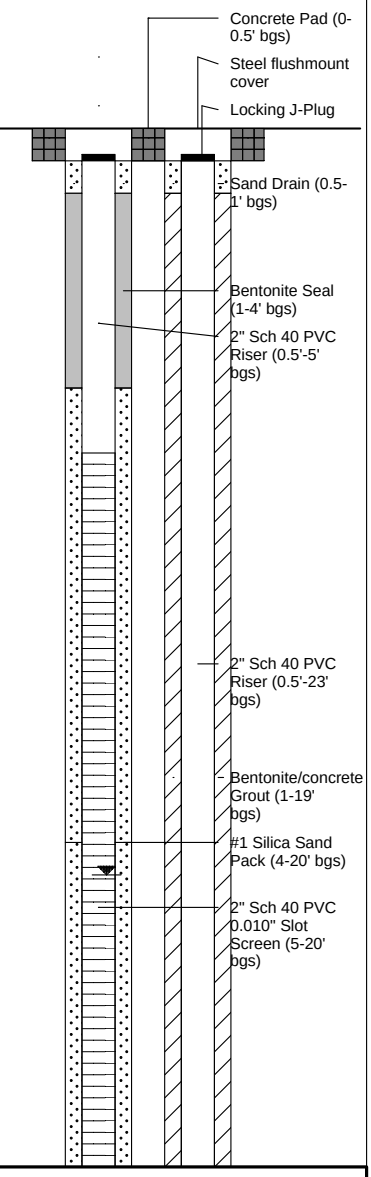
Well/Boring ID: **PZ104D / PZ104S**

Client: Cold Springs Northern Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
	375								
0							0.2		Grass at surface, medium to light brown/grey SANDY SILT, little fine subabngular to angular Gravel, wet, firm
							0.3		Light to medium brown CLAYEY SILT, very dense, dry to moist, slightly plastic.
							73.9		Light to medium brown CLAYEY SILT, grey staining, very dense, dry to moist, slightly plastic, odor
	370	NA	0-8	NA	NA	NA			Light grey, CLAYEY SILT, trace fine Sand, trace Organics, trace subrounded fine to medium Gravel, moist, odors.
5							376.4		
							NA		Light grey SILTY SAND, trace fine subangular Gravel, black staining, odor.
	365	1	8-10	1.1	2 2 3 3	5	381.3		Light grey to black SILTY SAND, trace Clayey Silt, dark staining, loose, moist to wet, odors.
10		2	10-12	1.0	1 2 4 4	6	742.1 97.3		Light grey fine SAND, trace Silt, moist-wet, staining, odor.
		3	12-14	1.3	6 4 4 5	8	176.1 238		Light brown fine to medium SAND, wet, sheen at 12.9', loose, odors.
	360	4	14-16	1.3	2 3 3 5	6	0.3		Light brown fine to medium SAND, wet, loose.
15									

Well/Boring Construction



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Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

PZ104S was drilled and installed based on information collected at PZ104D

Client: Cold Springs Northern Terminal

Well/Boring ID: PZ104D / PZ104S

Site Location:
Lysander, NY

Borehole Depth: 26.7' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		5	16-18	1.6	4 5 5 7	10	0.0		Light brown fine to medium SAND, wet, loose.	#1 Silica Sand Pack (4-20' bgs)
		6	18-20	1.4	4 5 5 5	10	0.1			Bentonite/concrete Grout (1-19' bgs)
	355									2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
20		7	20-22	1.3	2 3 3 4	6	0.0		Medium brown fine to medium SAND, wet, moderately firm/dense.	Bentonite Seal (19-21' bgs)
		8	22-24	1.6	4 8 8 6	16	0.0 0.0		Medium brown fine to medium SAND, wet, moderately firm/dense. Fine to medium SAND and fine subrounded to subangular GRAVEL, firm, wet.	2" Sch 40 PVC Riser (0.5'-23' bgs) #1 Silica Sand Pack (21-25' bgs)
	350									
25		9	24-26	1.2	10 8 20 30	28	5 NA		Medium brown fine to medium SAND, wet, moderately firm/dense (running sands). Dark black fine angular GRAVEL, odor.	2" Sch 40 PVC 0.010" Slot Screen (23-25' bgs)
		10	26-26.7	0.7	46	NA	2.2 2.2		Fine to medium SAND and fine subrounded to subangular GRAVEL, firm, wet.	Natural cave-in
									Boring terminated at 26.7' bgs.	
	345									
30										
	340									
35										

ARCADIS Design & Consultancy for natural and built assets

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

PZ104S was drilled and installed based on information collected at PZ104D

Date Start/Finish: 4/7/16-4/12/16
Drilling Company: Parratt Wolff
Driller's Name: Mike Evans
Drilling Method: Hollow Stem Auger
Auger Size: 4.25" ID
Rig Type: CME-55
Sampling Method: 2" x 2' Split Spoon

Northing: 1141062.30
Easting: 909029.55
Casing Elevation: D 373.41' AMSL
Addit. Casing Elevation: S 373.47' AMSL
Borehole Depth: 27.1' bgs
Surface Elevation: 373.70' AMSL

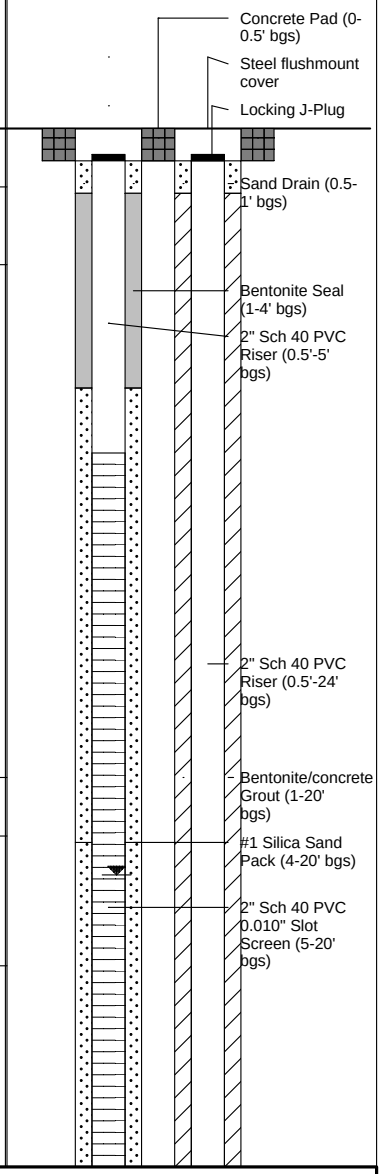
Descriptions By: Ethan Ulm

Well/Boring ID: **PZ105D / PZ105S**

Client: Cold Springs Northern Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
	375								
0							1		Grass and roots at the surface. Dark grey to brown SILTY SAND, some fine subangular Gravel, wet.
							0.6		Light to medium CLAYEY SILT, trace fine Sand, firm, moist.
									Light to medium brown CLAYEY SILT, trace fine Sand, trace fine subangular Gravel, trace Clay, firm.
	370	NA	0-8	NA	NA	NA			
5							48.4		
	365	1	8-10	NR	2 3 3 3	6	70.3		
10		2	10-12	1.6	1 2 5 6	7	49.1		Light brown to light grey CLAYEY SILT, trace coarse Sand, slightly plastic, wet, odor.
							100.6		Light brown to grey fine SILTY SAND, trace Clayey Silt, wet, odor.
		3	12-14	1.5	5 6 8 9	14	280.7 280.7 280.7		Light grey/brown fine to medium SAND, trace Clayey Silt, moist- wet, firm, odor.
	360								
15		4	14-16	1.5	4 5 7 5	12	3.6		



Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

PZ105S was drilled and installed based on information collected at PZ105D

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northern Terminal

Well/Boring ID: **PZ105D / PZ105S**

Site Location:
Lysander, NY

Borehole Depth: 27.1' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		5	16-18	1.6	8 7 7 6	14	5.1		Light grey/brown fine to medium SAND, trace Clayey Silt, moist- wet, firm, odor.	#1 Silica Sand Pack (4-20' bgs)
	355	6	18-20	1.4	5 7 9 8	16	1.3			Bentonite/concrete Grout (1-20' bgs) 2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
20		7	20-22	1.2	7 6 8 8	14	2.7			2" Sch 40 PVC Riser (0.5'-24' bgs) Bentonite Seal (20-22' bgs)
		8	22-24	1.8	9 9 8 9	17	1.8			#1 Silica Sand Pack (22-26' bgs)
	350	9	24-26	1.5	6 7 10 9	17	3.2			2" Sch 40 PVC 0.010" Slot Screen (24-26' bgs)
25		10	26-27.1	1.1	6 21	NA	3.2 3.2		Green/red/tan/grey medium to coarse SAND with subrounded clasts of coarse Sand/ fine Gravel.	Natural cave-in
									Boring terminated at 27.1' bgs.	
	345									
30										
	340									
35										

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

PZ105S was drilled and installed based on information collected at PZ105D

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Date Start/Finish: 4/13/16
Drilling Company: Parratt Wolff
Driller's Name: Mike Evans
Drilling Method: Hollow Stem Auger
Auger Size: 4.25" ID
Rig Type: CME-55
Sampling Method: 2" x 2' Split Spoon

Northing: 1141279.48
Easting: 909152.97
Casing Elevation: 374.02' AMSL
Addit. Casing Elevation: NA
Borehole Depth: 15.5' bgs
Surface Elevation: 374.51' AMSL

Descriptions By: Ethan Ulm

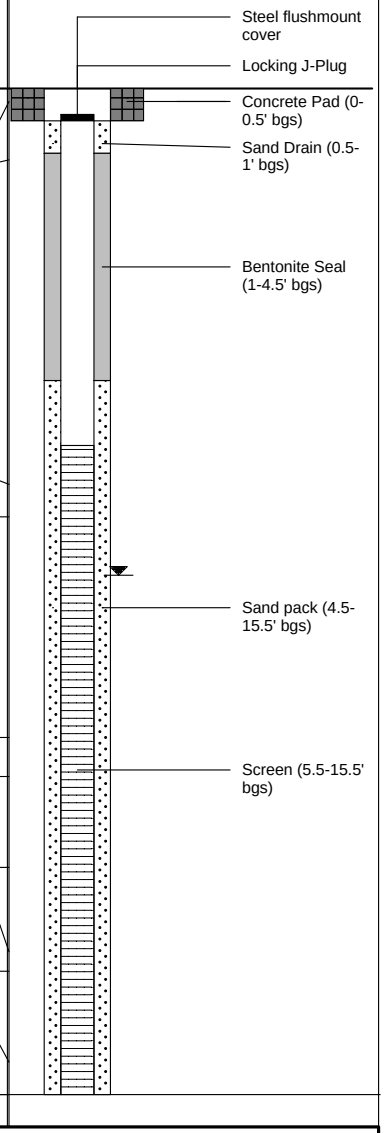
Well/Boring ID: **PZ106S**

Client: Cold Springs Northern Terminal

Location: Lysander, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
	375								
0							0.0		Asphalt.
							0.0		Light grey fine angular GRAVEL, some medium to coarse Sand, moist to wet,
									Light brown SILTY SAND, Organics (roots), thin lmainations of light grey Silt, increase Clayey Silt with depth, dry to moist, dense.
		NA	0-5	NA	NA	NA	0.0		
	370								
5		1	5-6	1.0	6 6	NA	0.3		
					4		7.5		Light brown fine SAND, trace Silt, moist-wet.
		2	6-8	1.5	6 6	12	7.5		Light brown fine SAND, trace Silty Sand, moist-wet, grey to black staining, odor.
					8		23.5		
		3	8-10	1.1	3 4 5	9	45		
	365				4				
10					2		9.4		Medium to dark grey SILTY SAND, loose to firm, wet, trace NAPL/staining.
		4	10-12	1.5	6 9 8	15	9.4		Light brown/tan fine SAND with coarse Sand, fine angular Gravel, trace Silt, moist-dry.
					8		0.4		Medium to dark grey SILTY SAND, loose to firm, wet, trace NAPL/staining.
		5	12-14	2.0	8 10	18	1.1		Light brown/tan/ olive green fine SAND and SILT, trace subrounded-subangular Gravel, moist.
					10		1.1		Light to medium grey/brown fine SAND, little subangular Gravel, moist.
	360				6				
15		6	14-15.5	1.5	8 20 36/0.0	28	0.0 0.0		Medium to fine SAND, some fine subangular Gravel, dense, compact, dry-moist.
									Refusal at 15.5' bgs (possible Till).

Well/Boring Construction



Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

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APPENDIX 3

Boring Logs from 2018

Date Start/Finish:	8/3/2018	**Northing:**	1141257.52	**Well/Boring ID:**	**BMW14R**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	909096.33	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Wayne	**Casing Elevation:**	380.03	**Location:**	Lysander, NY
Drilling Method:	HSA	**Borehole Depth:**	20 feet bgs		
Sampling Method:	NA	**Surface Elevation:**	377.67		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	380							2.5' PVC Stickup
0							Hand auger to 5' bgs. Silty SAND, fine to medium; and GRAVEL; dry, light brown.	Grout (0-2' bgs)
		NA	NA	NA	NA			2" Sch. 40 PVC Riser (-2.5' ags-5' bgs)
	375	NA	NA	NA	NA			Bentonite Seal (2-3' bgs)
5		NA	NA	NA	NA		HSA to 20' bgs to end of boring.	
		NA	NA	NA	NA			
	370	NA	NA	NA	NA			
10		NA	NA	NA	NA			#0 Sand Pack (3-20' bgs)
	365	NA	NA	NA	NA			2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
15		NA	NA	NA	NA		SAND, fine to medium; trace Clay and Silt; dark gray/black, odor, slight sheen.	

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Remarks: Soil descriptions from auger cuttings.

ags = above ground surface; bgs = below ground surface;
NA = Not Applicable/Available; HSA = Hollow-stem augers.

Client: Cold Springs Northern Terminal

Well/Boring ID: **BMW14R**

Borehole Depth: 20 feet bgs

Site Location:
Lysander, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
360	NA	NA	NA	NA		SAND, fine to medium; trace Clay and Silt; dark gray/black, odor, slight sheen.	2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs); #0 Sand Pack (3-20' bgs)
	NA	NA	NA	NA			
20						End of boring at 20' bgs.	
355							
25							
350							
30							
345							
35							

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Remarks: Soil descriptions from auger cuttings.

ags = above ground surface; bgs = below ground surface;
NA = Not Applicable/Available; HSA = Hollow-stem augers.

Date Start/Finish:	5/18/2018	**Northing:**	1141290.74	**Well/Boring ID:**	**MW-201**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	908861.62	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	395.45	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	24 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	392.62		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
395							2.5' PVC Stickup
0						ORGANICS (leaves, roots, grass) and fine SAND; dark brown, dry, no odor.	
	1	0-2	1.5	0.0		Fine SAND, subangular to subround; trace Silt; loose, dry, light brown, no odor.	
390	2	2-4	1.7	0.0			
	3	4-6	1.5	0.0		Silty fine SAND, subangular to subround; some Clay; medium plasticity, moist, light brown, no odor.	Grout (0-11' bgs)
5	4	6-8	1.6	0.0		Moisture increase.	2" Sch. 40 PVC Riser (-2.5' ags-14' bgs)
385	5	8-10	1.7	0.0			
10	6	10-12	1.4	0.0		SAND, fine to medium; little Silt; loose, drier than previous samples, light brown, no odor.	Bentonite Seal (11-12' bgs)
380	7	12-14	1.3	0.0			#0 Sand Pack (12-24' bgs)
	8	14-16	1.6	0.0		Moist, well sorted.	2" Sch 40 PVC 0.010" Slot Screen (14-24' bgs)
15							

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Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-201**

Site Location:
Lysander, NY

Borehole Depth: 24 feet bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
375	9	16-18	1.8	0.0		SAND, fine to medium; little Silt; loose, drier than previous samples, light brown, no odor.	#0 Sand Pack (12-24' bgs)
	10	18-20	1.9	0.0		SAND and SILT; fine to medium, loose, saturated at 19' bgs, light brown, no odor.	2" Sch 40 PVC 0.010" Slot Screen (14-24' bgs)
20	11	20-22	1.6	0.0		Fine to medium SAND and GRAVEL, subangular and subround; some Silt, dense, reddish-brown, no odor. [TILL MATERIAL]	
370	12	22-24	1.1	0.0			
25						End of boring at 24' bgs.	
365							
30							
360							
35							

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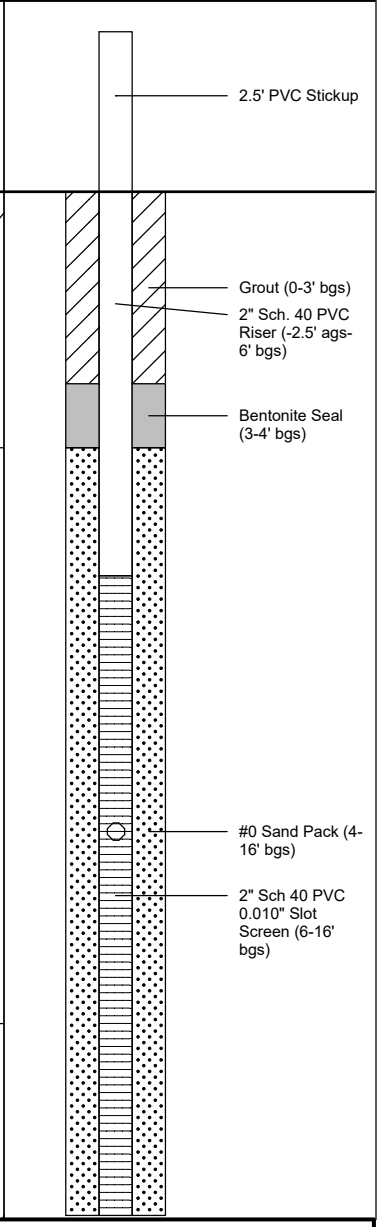
NA = Not Applicable/Available; HSA = Hollow-stem augers.

Date Start/Finish:	5/21/2018	**Northing:**	1141329.17	**Well/Boring ID:**	**MW-202**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	908898.17	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	395.59	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	16.5 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	393.22		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
	395						
0							ORGANICS (leaves, roots, grass) and Silty fine SAND; dark brown, dry, no odor.
		1	0-2	1.0	2.7		SAND; fine to medium, subangular to subround; trace Silt; loose, dry, light brown, trace odor.
							Increases Silt, no odor.
	390	2	2-4	1.6	0.0		
5		3	4-6	1.1	0.0		Silty SAND; fine to medium, subangular to subround, well sorted, loose, light brown, moist, no odor.
		4	6-8	1.2	0.0		
	385	5	8-10	NA	NA		
10		6	10-12	1.2	0.0		
		7	12-14	1.7	0.0		Fine to medium SAND and GRAVEL; subangular to subround, dense, reddish-brown, no odor. [TILL MATERIAL]
	380						
15		8	14-16	1.6	0.0		Large clasts at 15-16' bgs, dry.



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Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-202**

Site Location:
Lysander, NY

Borehole Depth: 16.5 feet bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-16.5	0.5	0.0		Split spoon refusal. [BASAL TILL] End of boring at 16.5' bgs.	
	375							
20								
	370							
25								
	365							
30								
	360							
35								

Remarks: ags = above ground surface; bgs = below ground surface;
NA = Not Applicable/Available; HSA = Hollow-stem augers.

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Date Start/Finish:	5/21/2018	**Northing:**	1141307.55	**Well/Boring ID:**	**MW-203**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	909013.86	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	394.58	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	20 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	392.27		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	395							2.5' PVC Stickup
0							ORGANICS (leaves, roots, grass) and fine SAND; dark brown, dry, no odor.	
		1	0-2	1.1	0.0		Silty SAND, fine to medium; trace Organics; well sorted, moist, light brown, no odor.	Grout (0-2' bgs)
	390	2	2-4	1.8	0.0			2" Sch. 40 PVC Riser (-2.5' ags-5' bgs)
		3	4-6	1.4	0.0			Bentonite Seal (2-3' bgs)
5							Damp at 6' bgs. Possible perched water.	
		4	6-8	1.8	0.0		Silty SAND, fine to medium, subangular to subround, well sorted, moist (less water than previous spoon), light brown, no odor.	
	385	5	8-10	1.8	12.0		Wet at 8' bgs.	
10							Black, hydrocarbon odor, no sheen, wet.	#0 Sand Pack (3-20' bgs)
		6	10-12	1.5	45.7			
	380	7	12-14	1.7	39.2			2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
							Silty SAND; fine to medium, subangular to subround, well sorted, light gray, wet, hydrocarbon odor.	
15		8	14-16	1.8	12.1			

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

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Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-203**

Site Location:
Lysander, NY

Borehole Depth: 20 feet bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
375	9	16-18	NA	NA		No recovery.	#0 Sand Pack (3-20' bgs); 2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
	10	18-20	1.8	1.8		Fine to medium SAND and GRAVEL; subangular to subround; some Silty Clay, dense, reddish-brown, moist, no odor. [TILL MATERIAL]	
20						End of boring at 20' bgs.	
370							
25							
365							
30							
360							
35							

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Date Start/Finish:	5/22/2018	**Northing:**	1141427.24	**Well/Boring ID:**	**MW-204**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	908980.08	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	395.19	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	20 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	392.71		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	395							2.5' PVC Stickup
0							ORGANICS (leaves, roots, grass) and fine SAND.	
		1	0-2	1.2	0.0		Silty SAND; fine to medium, subangular to subround, loose, moist, brown, no odor.	Grout (0-2' bgs)
	390	2	2-4	0.5	0.0			2" Sch. 40 PVC Riser (-2.5' ags-5' bgs)
		3	4-6	0.3	0.0		Low recovery. Dark brown.	Bentonite Seal (2-3' bgs)
5		4	6-8	2.0	0.5		Fine to medium SAND and GRAVEL; subangular to subround, poorly sorted, loose, light brown/red, wet. [TILL]	
	385	5	8-10	0.5	2.1		Medium dense, gray/red.	
10		6	10-12	2.0	4.7		SAND and GRAVEL, fine to medium; some Silty Clay; poorly sorted, medium dense, gray, wet, slight odor.	#0 Sand Pack (3-20' bgs)
	380	7	12-14	2.0	13.7			2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
15		8	14-16	2.0	0.6		Light brown, no odor.	

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

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Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-204**

Site Location:
Lysander, NY

Borehole Depth: 20 feet bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
375	9	16-18	1.2	1.0		Reddish brown, no odor.	#0 Sand Pack (3-20' bgs)
	10	18-20	1.0	0.2			2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
20						End of boring at 20' bgs.	
370							
25							
365							
30							
360							
35							

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Remarks: ags = above ground surface; bgs = below ground surface;
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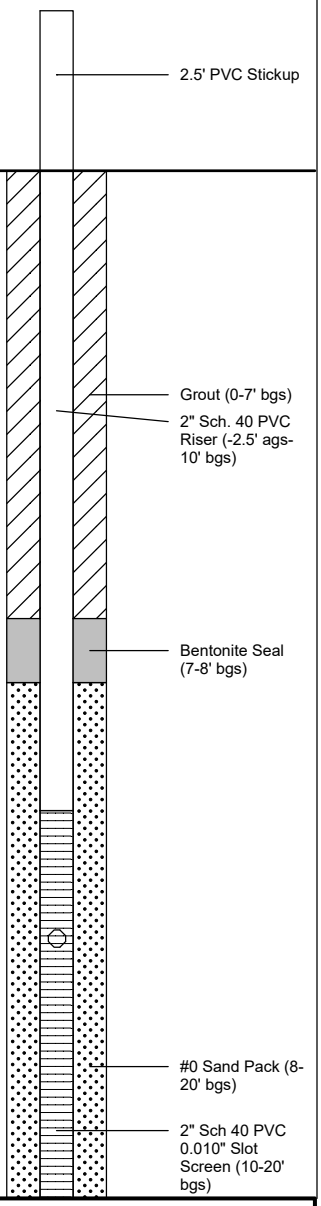
Date Start/Finish:	5/17 - 5/18/2018	**Northing:**	1141543.83	**Well/Boring ID:**	**MW-205**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	908866.84	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	397.97	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	20 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	395.00		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	395	1	0-2	0.9	0.0		ORGANICS (leaves, roots, grass) and fine SAND; moist, loose, dark brown, no odor. SAND, fine to medium; some Clay and Organics, poorly sorted, loose, moist, light brown, no odor.
		2	2-4	1.7	60.5		SAND, fine to medium, subangular to subround; some Gravel and Silt, light brown, moist, medium dense, hydrocarbon odor, no staining.
5	390	3	4-6	1.7	133.9		Reduced odor from 5 to 6' bgs and PID readings.
		4	6-8	1.6	17.2		SAND, fine to medium, subangular to subround; some fine Gravel and Silt; medium dense, grayish brown, moist, trace odor.
		5	8-10	0.9	3.4		SAND, fine to medium, subangular to subround; some Gravel and Clay; dense, poorly sorted, dry, gray, trace odor. [TILL MATERIAL]
10	385	6	10-12	1.0	0.6		Moist, no odor.
		7	12-14	1.8	1.3		Wet.
15	380	8	14-16	0.8	0.0		Light brown.



Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

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Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-205**

Site Location:
Lysander, NY

Borehole Depth: 20 feet bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	9	16-18	0.9	0.0		SAND, fine, subangular, subround, some Gravel and Silty Clay, dense, poorly sorted, reddish-brown, wet, no odor. [TILL]	#0 Sand Pack (8-20' bgs)
	10	18-20	1.5	0.0			2" Sch 40 PVC 0.010" Slot Screen (10-20' bgs)
20 375						End of boring at 20' bgs.	
25 370							
30 365							
35 360							

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Remarks: ags = above ground surface; bgs = below ground surface;
NA = Not Applicable/Available; HSA = Hollow-stem augers.

Date Start/Finish:	5/16-5/17/2018	**Northing:**	1141541.04	**Well/Boring ID:**	**MW-206**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	908921.18	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	398.01	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	20 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	395.17		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
								2.5' PVC Stickup
0	395	1	0-2	1.4	0.0		ORGANICS (leaves, roots, grass) and fine SAND; moist, loose, dark brown, no odor. SAND, fine to medium; some Silt and Organics; poorly sorted, loose, moist, light brown, no odor.	Grout (0-2' bgs) 2" Sch. 40 PVC Riser (-2.5' ags-5' bgs)
		2	2-4	1.2	0.0		Silty SAND, fine to medium, sub angular to subround; some Gravel, loose, moist, light brown, no odor.	Bentonite Seal (2-3' bgs)
5	390	3	4-6	1.7	0.0			
		4	6-8	0.9	0.0		Fine SAND and GRAVEL; some Clay; poorly sorted, dense, moist, gray, no odor. Dense, moist, no odor. [TILL MATERIAL]	
		5	8-10	1.2	0.0			
10	385	6	10-12	1.1	0.0		Larger Gravel (1-3 cm). No recovery.	#0 Sand Pack (3-20' bgs)
		7	12-14	1.2	0.0		SAND, fine to medium, subangular to subround; some Gravel and Clay, poorly sorted, medium dense, wet at 12' bgs, no odor. [TILL MATERIAL]	2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
15	380	8	14-16	1.9	0.0		Increased medium SAND, light brown.	

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

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Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-206**

Site Location:
Lysander, NY

Borehole Depth: 20 feet bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	1.5	0.0		SAND and GRAVEL, fine to medium; trace Clay; medium dense, poorly sorted, wet, reddish-brown, no odor. [TILL]	#0 Sand Pack (3-20' bgs)
		10	18-20	1.6	0.0		Fining downward.	2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
20	375						End of boring at 20' bgs.	
25	370							
30	365							
35	360							

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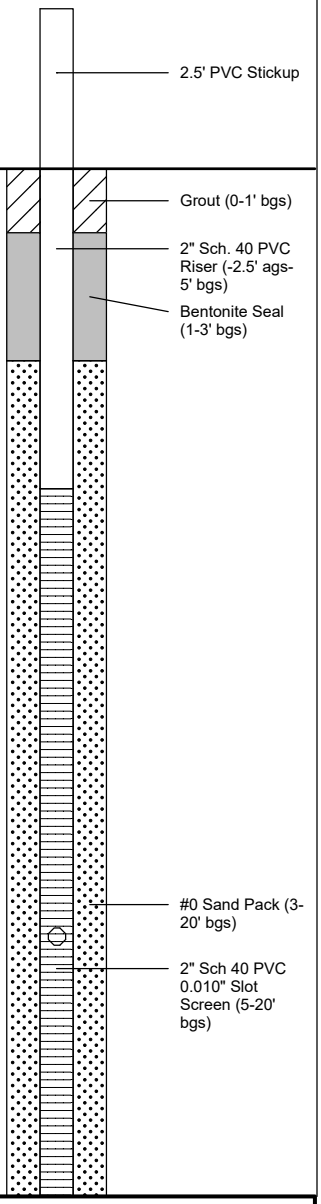
Remarks: ags = above ground surface; bgs = below ground surface;
NA = Not Applicable/Available; HSA = Hollow-stem augers.

Date Start/Finish:	5/16/2018	**Northing:**	1141519.38	**Well/Boring ID:**	**MW-207**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	908997.73	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	398.80	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	20 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	395.72		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	395	1	0-2	1.4	0.0		SAND and ORGANICS (leaves and stems); some Gravel and Clay; medium dense, light brown, moist, no odor.
		2	2-4	2.0	0.0		SAND, fine to medium, subangular to subround, well sorted; some Silt, light brown, moist, no odor.
5	390	3	4-6	1.5	0.0		SAND, medium, subangular to subround; some Gravel, round; little Silt; poorly sorted, loose, moist, light brown, no odor.
		4	6-8	2.0	0.0		SAND, fine, subangular to subround; some Gravel, round; poorly sorted, dense, moist, light gray, no odor.
		5	8-10	1.7	0.0		Silty SAND and CLAY, fine; and fine to coarse Gravel; extremely dense, moist, grayish-red, no odor. [TILL]
10	385	6	10-12	1.9	0.0		Fining downwards. Additional fine SAND and CLAY, medium plasticity, no odor.
		7	12-14	1.2	0.0		Silty SAND, fine to medium; and GRAVEL; some Clay; medium plasticity, no odor, wet at 13.5-14' bgs.
15	380	8	14-16	0.0	0.0		No recovery.



Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

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Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-207**

Site Location:
Lysander, NY

Borehole Depth: 20 feet bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	1.5	0.0		Silty SAND, fine, subangular to subround; some Gravel, round; very dense, wet, grayish-red, no odor. [TILL]	#0 Sand Pack (3-20' bgs)
		10	18-20	2.0	0.0		Reddish-brown.	2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
20	375						End of boring at 20' bgs.	
25	370							
30	365							
35	360							

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Remarks: ags = above ground surface; bgs = below ground surface;
NA = Not Applicable/Available; HSA = Hollow-stem augers.

Date Start/Finish:	5/15/2018	**Northing:**	1141526.88	**Well/Boring ID:**	**MW-208**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	909080.26	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	397.34	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	20 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	394.31		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	395							2.5' PVC Stickup
0							SILT and ORGANICS (roots, leaves).	Grout (0-1' bgs)
		1	0-2	1.6	0.0		Silty SAND, fine; trace Clay; moist, light brown, no odor.	2" Sch. 40 PVC Riser (-2.5' ags-5' bgs)
		2	2-4	1.8	0.0		Well-sorted, subangular to subround.	Bentonite Seal (1-3' bgs)
	390	3	4-6	1.4	0.0		Slightly coarser (medium SAND).	
5		4	6-8	1.6	0.0		Silty SAND, fine to medium, subangular to subround; trace Clay and Organics, light brown, moist, no odor.	
	385	5	8-10	1.7	0.0			
10		6	10-12	1.8	0.0		Silty SAND, fine, subangular to subround, well sorted, light brown, no odor.	#0 Sand Pack (3-20' bgs)
		7	12-14	1.8	0.2		Wet at 12' bgs.	2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
	380	8	14-16	1.2	7.1		Silty SAND, fine to medium; some Clay; gray, wet, trace odor.	
15					1.4		Silty SAND, fine; some Clay and Gravel; poorly sorted, dense, red, no odor.	

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

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Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-208**

Site Location:
Lysander, NY

Borehole Depth: 20 feet bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	9	16-18	2.0	3.5		Gray with additional Gravel throughout, no odor.	#0 Sand Pack (3-20' bgs)
375	10	18-20	2.0	4.1		Dense.	2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
20						End of boring at 20' bgs.	
370							
25							
365							
30							
360							
35							

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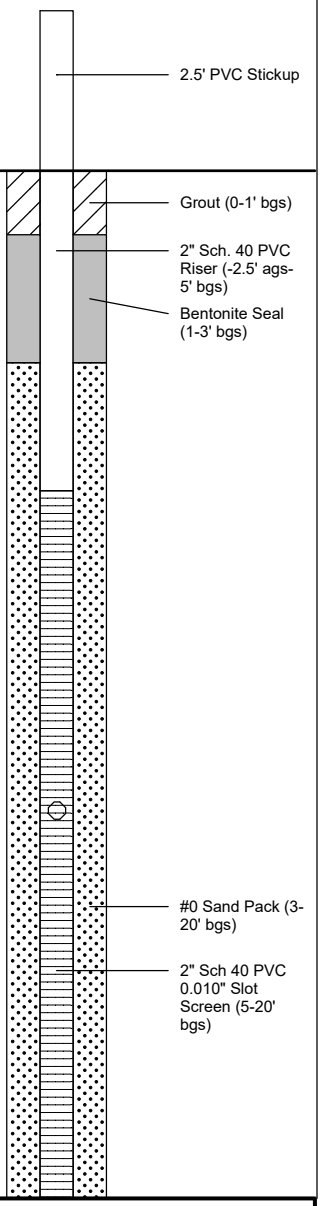
Remarks: ags = above ground surface; bgs = below ground surface;
NA = Not Applicable/Available; HSA = Hollow-stem augers.

Date Start/Finish:	5/14/2018	**Northing:**	1141600.72	**Well/Boring ID:**	**MW-209**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	909076.11	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	397.85	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	20 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	395.01		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	395						
		1	0-2	1.2	0.0		ORGANICS (roots and leaves).
							SAND. fine to medium; some Silty Clay, dense, dry, light brown no odor.
		2	2-4	2.0	0.0		SAND, fine to medium, subangular to subround; trace Silt; dry, no odor.
							Silty SAND, fine; trace Gravel and mottled Clay; low plasticity, moist, light brown, no odor.
5	390	3	4-6	1.3	0.3		Silty SAND, fine; trace Gravel, fine; moist, light brown, no odor.
		4	6-8	1.1	0.6		Silty SAND, fine; some Clay; trace Gravel; medium plasticity, light gray, moist, no odor.
		5	8-10	1.7	0.4		
10	385	6	10-12	1.1	0.3		Wet at 10' bgs.
		7	12-14	1.5	0.0		Additional medium SAND, subangular to subround.
15	380	8	14-16	1.0	0.0		SAND, medium to coarse, subangular to subround; trace Silty Clay and Gravel; increasing Clay at 16' bgs, light brown, no odor.



Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

ARCADIS Design & Consultancy for natural and built assets

Client: Cold Springs Northern Terminal

Well/Boring ID: **MW-209**

Site Location:
Lysander, NY

Borehole Depth: 20 feet bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	9	16-18	2.0	0.0		Silty SAND, fine; some Clay; trace Gravel; medium plasticity, light brown, no odor.	#0 Sand Pack (3-20' bgs)
	10	18-20	0.8	0.0		Dense at 20' bgs.	2" Sch 40 PVC 0.010" Slot Screen (5-20' bgs)
20 375						End of boring at 20.1' bgs.	
25 370							
30 365							
35 360							

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Date Start/Finish:	5/22/2018	**Northing:**	1141345.09	**Well/Boring ID:**	**MW-210**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	909129.64	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	386.85		
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	18 feet bgs	**Location:**	Lysander, NY
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	384.53		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	385							2.5' PVC Stickup
0		1	0-2	0.8	0.0		ORGANICS (stems, roots, grass) and fine SAND; some Gravel; loose, light brown, wet, no odor.	
		2	2-4	0.8	0.0		SAND and GRAVEL; poorly sorted, moist, reddish-brown, no odor.	Grout (0-5' bgs); 2" Sch. 40 PVC Riser (-2.5' ags-8' bgs)
	380	3	4-6	0.7	0.0			
5		4	6-8	0.8	0.0		[LOOSE TILL]	Bentonite Seal (5-6' bgs)
		5	8-10	0.5	0.0		Silty SAND, fine to medium; and GRAVEL; trace Clay; poorly sorted, medium dense, reddish-brown/gray, no odor.	
	375							
10		6	10-12	1.3	0.0		Silty SAND, fine to medium, subangular to subround; some Clay; trace Gravel; well sorted, medium dense, wet, light brown, no odor.	#0 Sand Pack (6-18' bgs)
		7	12-14	0.8	0.0		Increased Gravel content, reddish-brown. [TILL]	2" Sch 40 PVC 0.010" Slot Screen (8-18' bgs)
	370							
15		8	14-16	1.2	0.0		Silty SAND, fine to medium; and GRAVEL; very dense, moist, grayish brown, no odor. [TILL]	

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Client: Cold Springs Northern Terminal

Well/Boring ID: MW-210

Site Location:
Lysander, NY

Borehole Depth: 18 feet bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	9	16-18	0.7	0.0		Silty SAND, fine to medium; and GRAVEL; very dense, moist, grayish brown, no odor. [TILL]	#0 Sand Pack (6-18' bgs); 2" Sch 40 PVC 0.010" Slot Screen (8-18' bgs)
365 / 20						Refusal at 18' bgs. End of boring.	
360 / 25							
355 / 30							
350 / 35							

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Remarks: ags = above ground surface; bgs = below ground surface;
NA = Not Applicable/Available; HSA = Hollow-stem augers.

Date Start/Finish:	5/23/2018	**Northing:**	1141377.65	**Well/Boring ID:**	**MW-211**
Drilling Company:	Parratt-Wolff, Inc.	**Easting:**	909200.72	**Client:**	Cold Springs Northern Terminal
Driller's Name:	Matt Carnie	**Casing Elevation:**	387.68	**Location:**	Lysander, NY
Drilling Method:	Direct Push / HSA	**Borehole Depth:**	15 feet bgs		
Sampling Method:	2' x 2" Split Spoon	**Surface Elevation:**	384.48		
Rig Type:	Truck-Mounted Geoprobe Rig	**Descriptions By:**	Jeff Spradlin		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	385							2.5' PVC Stickup
0		1	0-2	0.5	0.0		Silty SAND and ORGANICS (roots, leaves); fine to medium, light to dark brown, damp, loose, no odor.	Grout (0-2' bgs)
		2	2-4	1.1	0.0		SAND, fine to medium, subangular to subround; and SILT; trace Gravel, fine; moist, loose, light brown, no odor.	2" Sch. 40 PVC Riser (-2.5' ags-5' bgs)
	380	3	4-6	1.2	0.0			Bentonite Seal (2-3' bgs)
5		4	6-8	0.9	0.0		Silty SAND, fine to medium, subangular to subround, well sorted, medium dense, wet, light brown, no odor.	
	375	5	8-10	1.5	0.0			#0 Sand Pack (3-15' bgs)
10		6	10-12	1.5	0.0		SAND and GRAVEL; fine to medium; some Clay, poorly sorted, medium dense, red/brown, no odor. [TILL]	2" Sch 40 PVC 0.010" Slot Screen (5-15' bgs)
		7	12-14	0.5	0.0			
	370						Final 2-inches: transitions to fine to medium SAND and GRAVEL; very dense, moist, light gray, no odor.	
15		8	14-16	0.5	0.0		Refusal at 15' bgs. End of boring.	

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Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; HSA = Hollow-stem augers.

APPENDIX 4

Laboratory Analytical Reports

Due to the large size of Appendix 4, the laboratory reports will be provided electronically to the agency only.

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